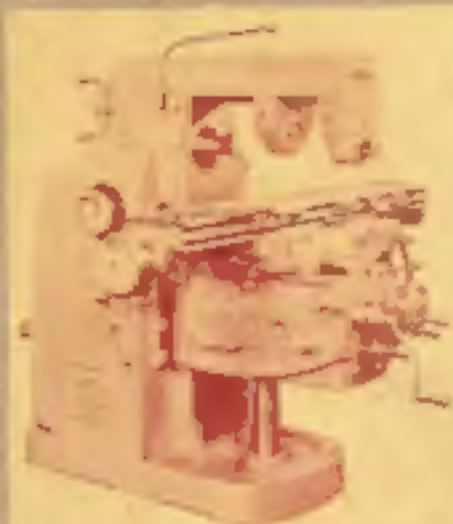


KEPT in Folder

FOLDER 566

*See
Machine
566*

SERVICE MANUAL AND PARTS LIST CATALOG



CINCINNATI®

**Nos. 2ML, 2MI and 3MI
MILLING MACHINES**

★

Identification No. 2J-LE
Publication No. M-2001

WHEN ORDERING REPAIR PARTS

1. Give complete Serial Number of Machine.
2. Give Part Number and Name.
3. Give Amount Required.

UNLESS THE ABOVE DATA IS INCLUDED WE CANNOT FILL YOUR ORDER

This Booklet should be Filed in Tool Crib and issued by Tool Check only

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

10/12/59
GA

SERIAL- NO 2J2P5H-11

MODEL-66205-10-M1

OUR MACH- 770 556

Kept in Folder 60

SERVICE MANUAL AND

PARTS LIST CATALOG

FOR

Cincinnati Nos. 2ML, 2MI and 3MI

MILLING MACHINES

MODEL LL



This catalog was prepared for two primary reasons. First, to expedite the ordering of repair parts for your CINCINNATI Nos. 2ML, 2MI and 3MI Milling Machines; secondly, to present to maintenance personnel the correct method of servicing these machines.

Due to continual improvements in design, it is possible that some information or the appearance of component parts to be found in this catalog may vary slightly from the machine delivered to you. This merely indicates that the mechanism has been improved to better fulfill your requirements.

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

**THIS CATALOG TO BE USED ONLY FOR MACHINES WHOSE
SERIAL NUMBERS BEGIN WITH 2J AND 5J**

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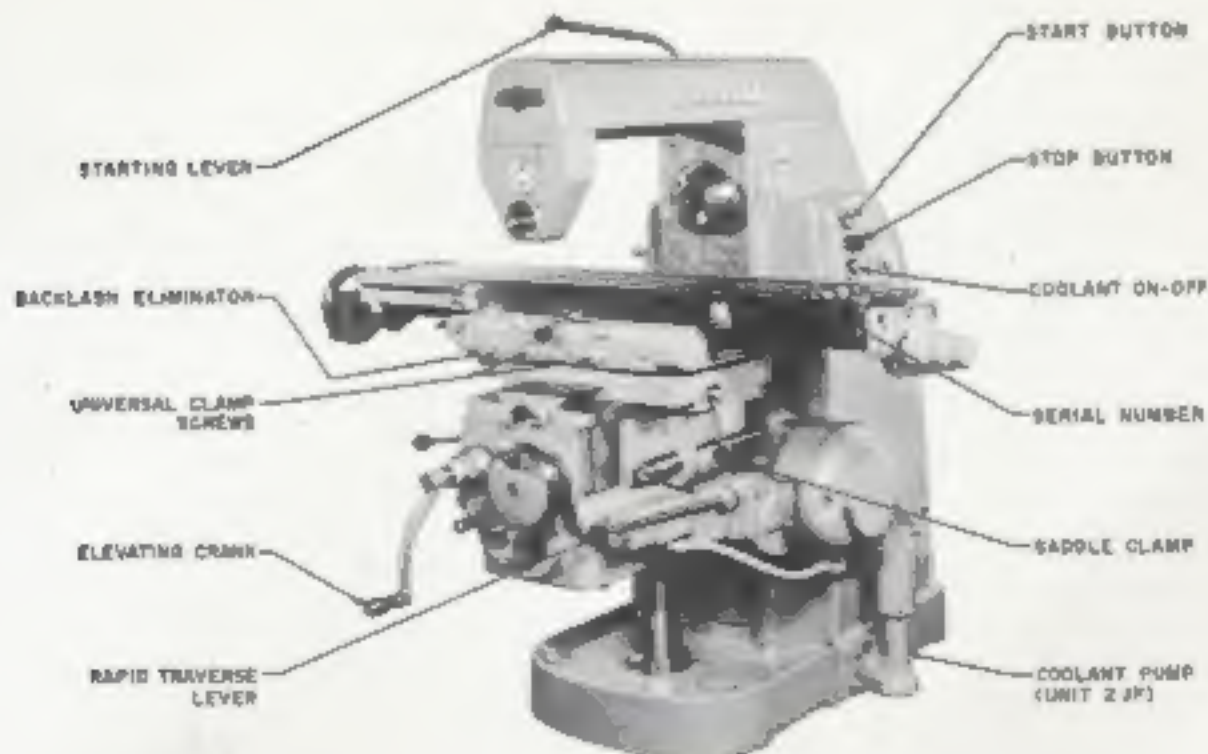
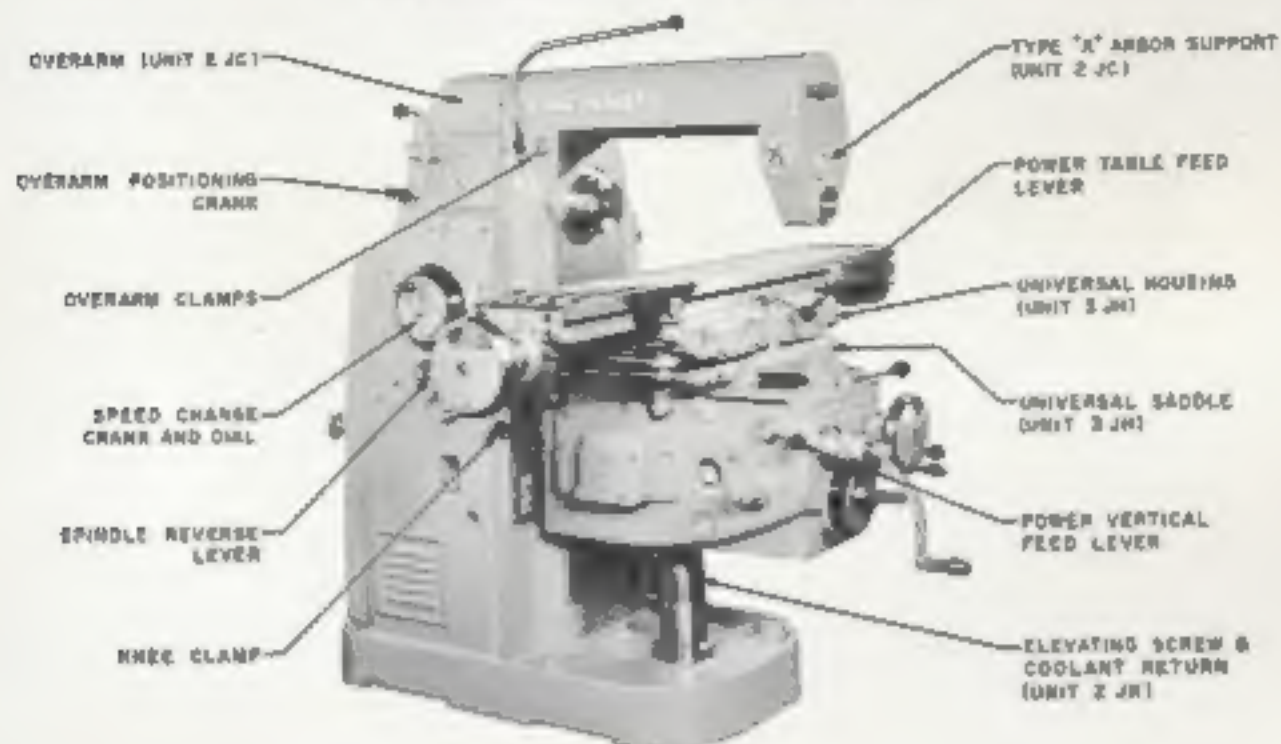
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NOTE: As a reference aid, figure numbers are the same as the page numbers on which they appear. As an example Figures 18 A and 18 B appear on page 18.

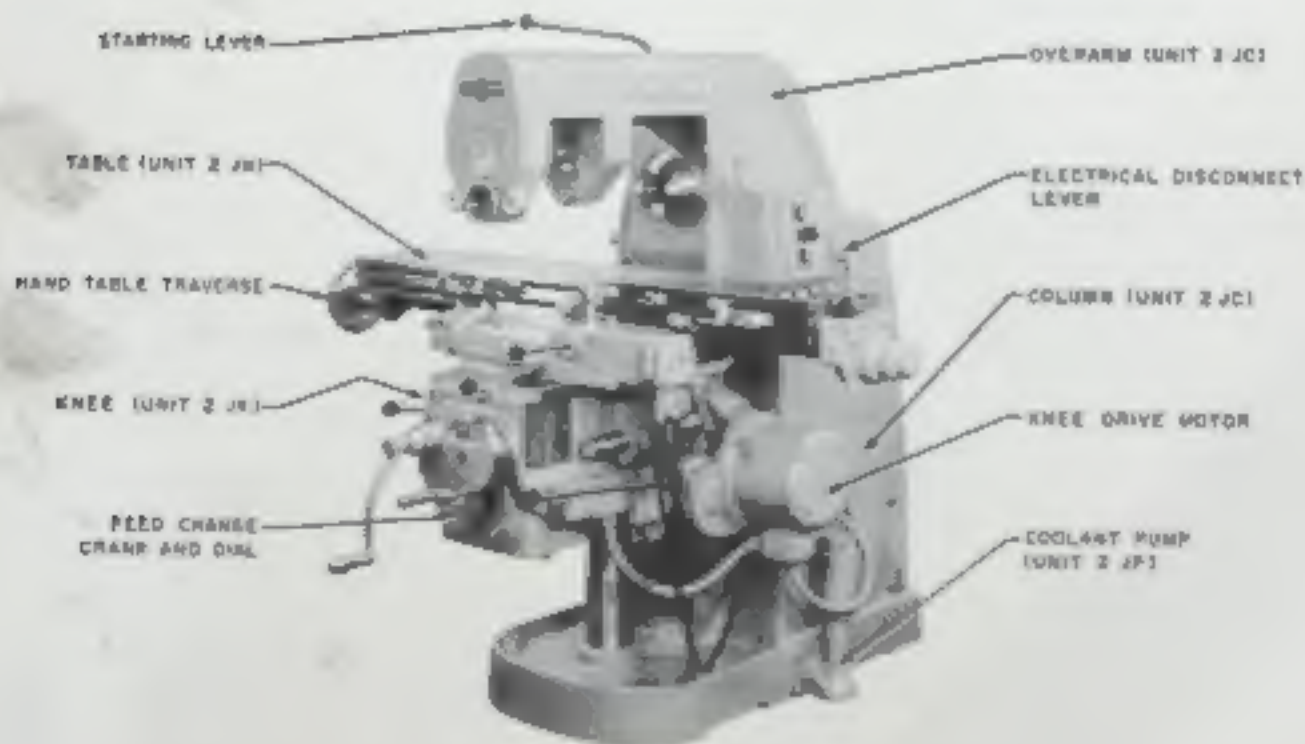
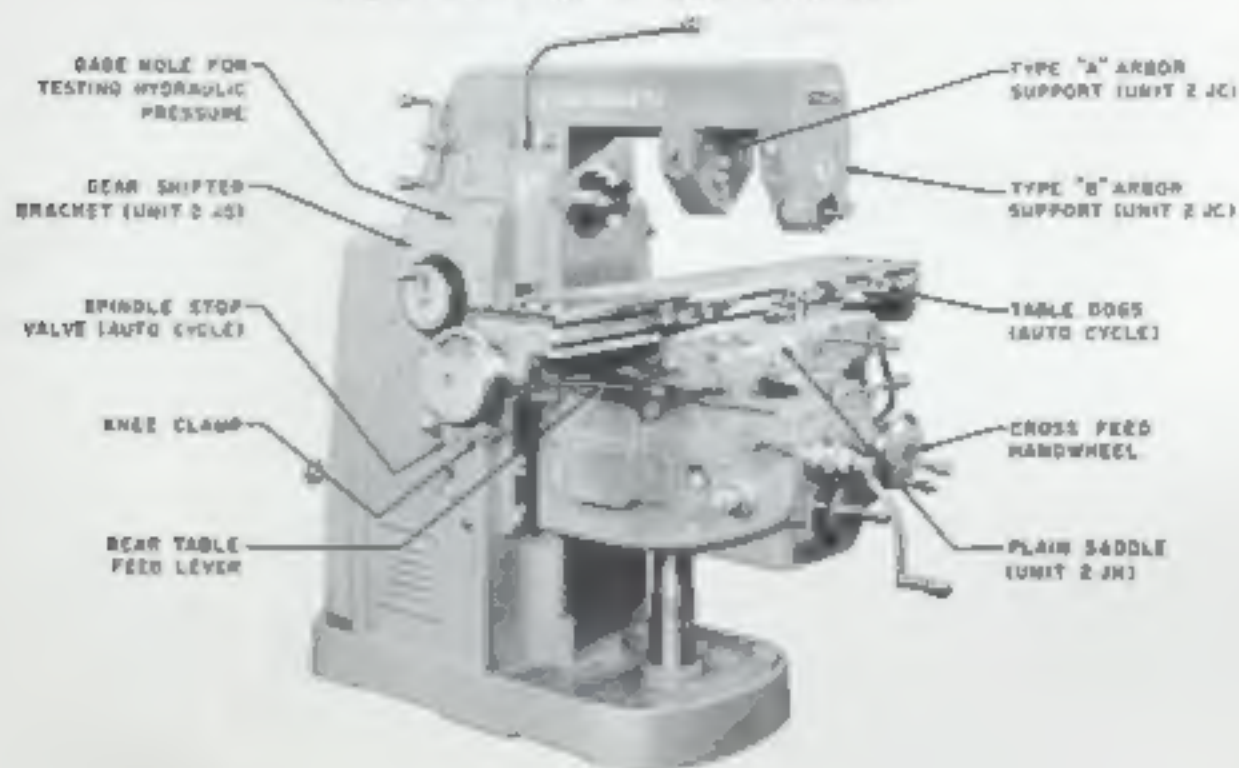
PATENT NOTICE: These machines and attachments are manufactured and protected by issued and pending United States and Foreign Patents. The design and specifications of these machines and attachments illustrated and described herein are subject to change without notice.

FUNCTIONAL DIAGRAM



FIGURES 4A and 4B
No. ZHI Universal Machine

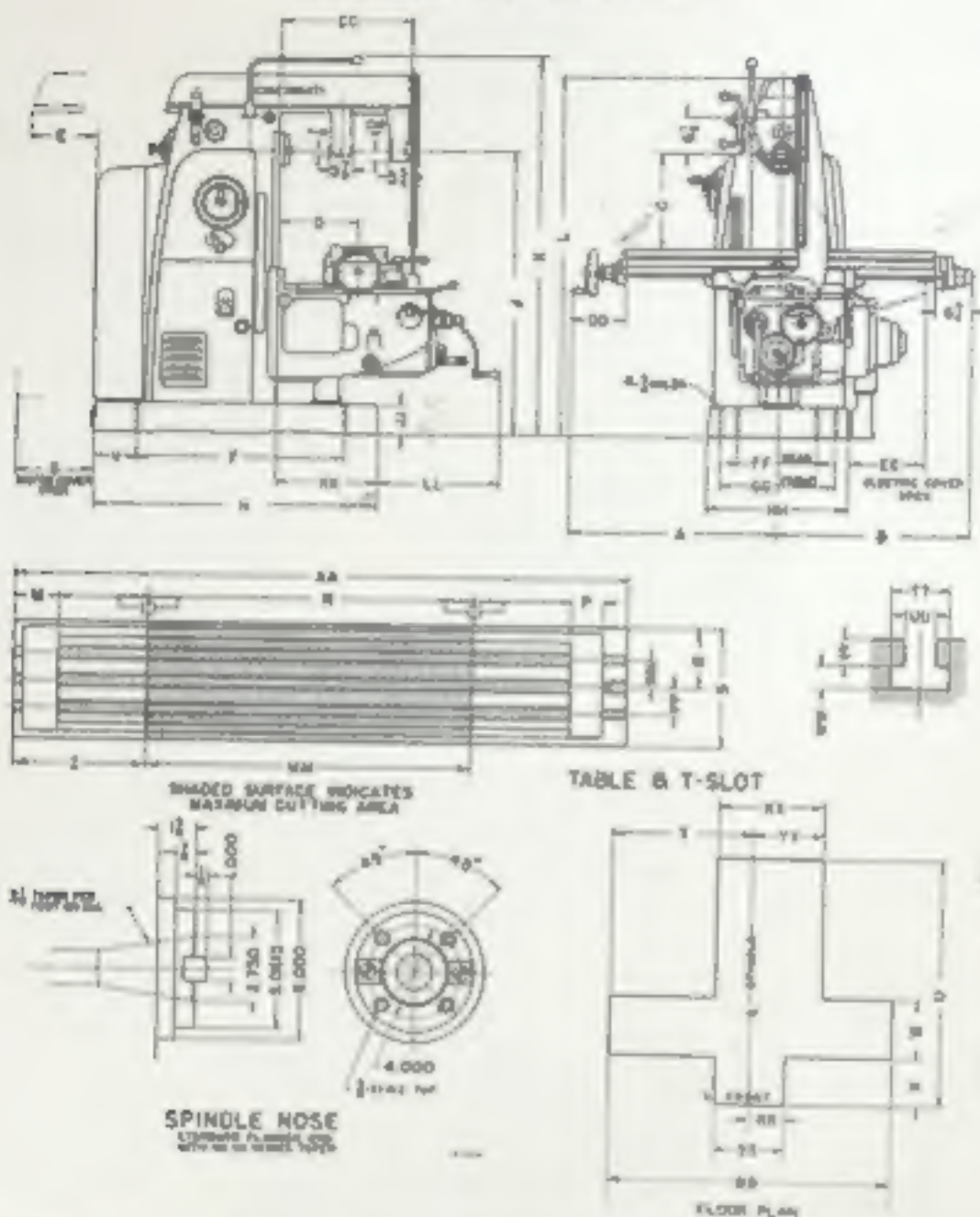
FUNCTIONAL DIAGRAM



FIGURES 6A and 6B
No. 2M1 Plain Machine

DIMENSIONAL DRAWING

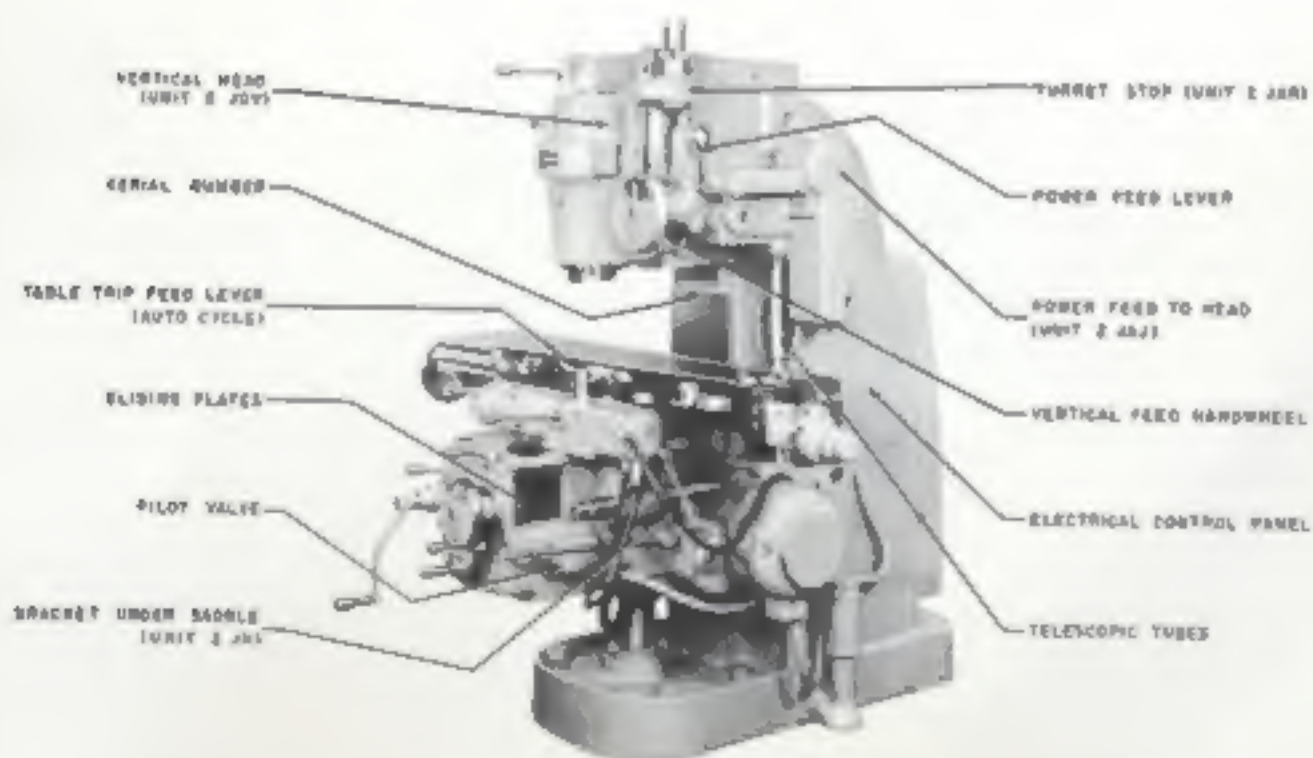
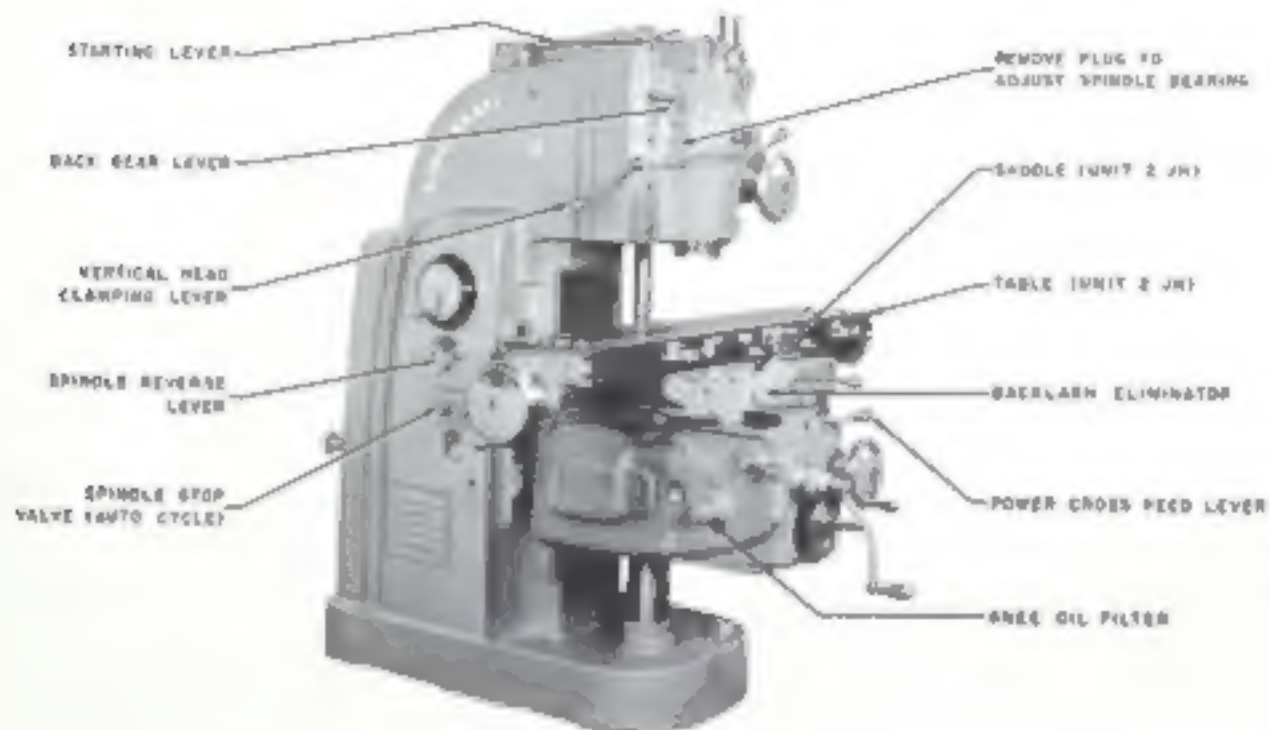
Nos. 2ML and 2MI-Plain



TYPE	SIZE	W	H	D	L	B	T	S	R	F	G	C	A	P	M	N	K	J	I	H	G	F	E	D	C	B	A
2ML	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2
2MI	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2
3MI	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2

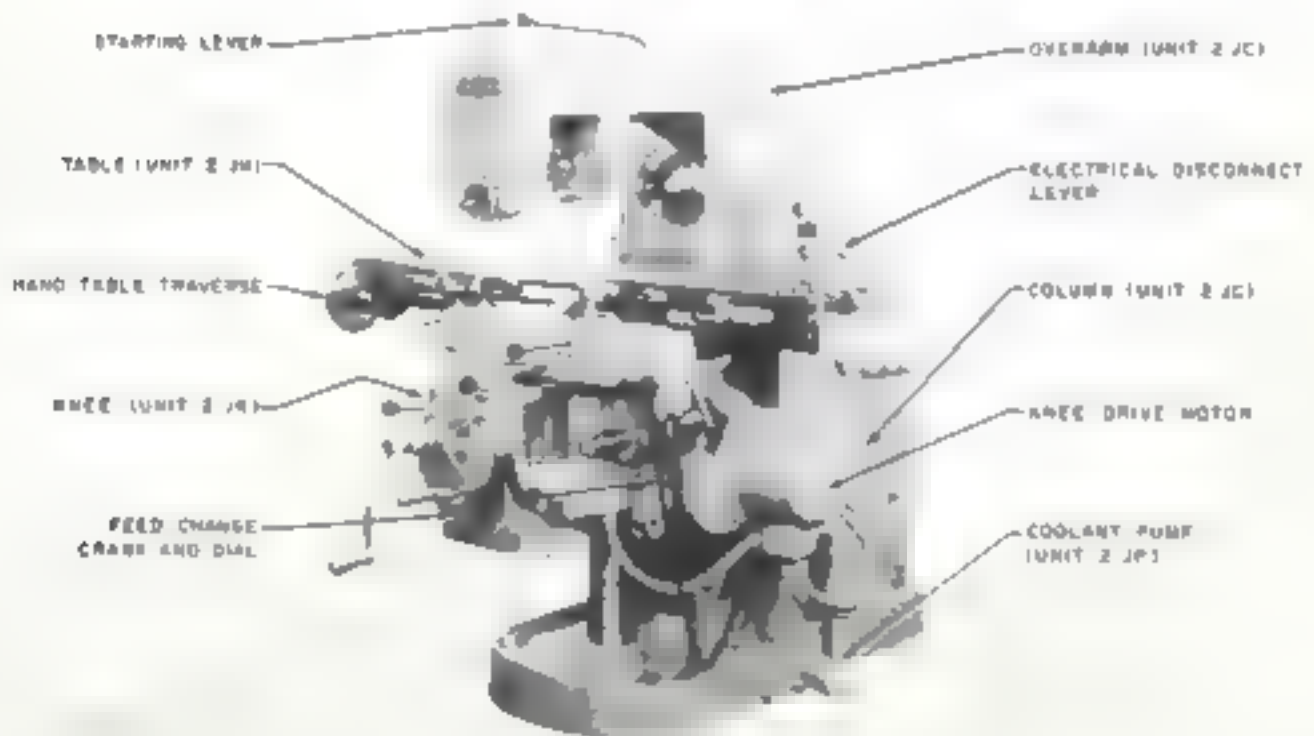
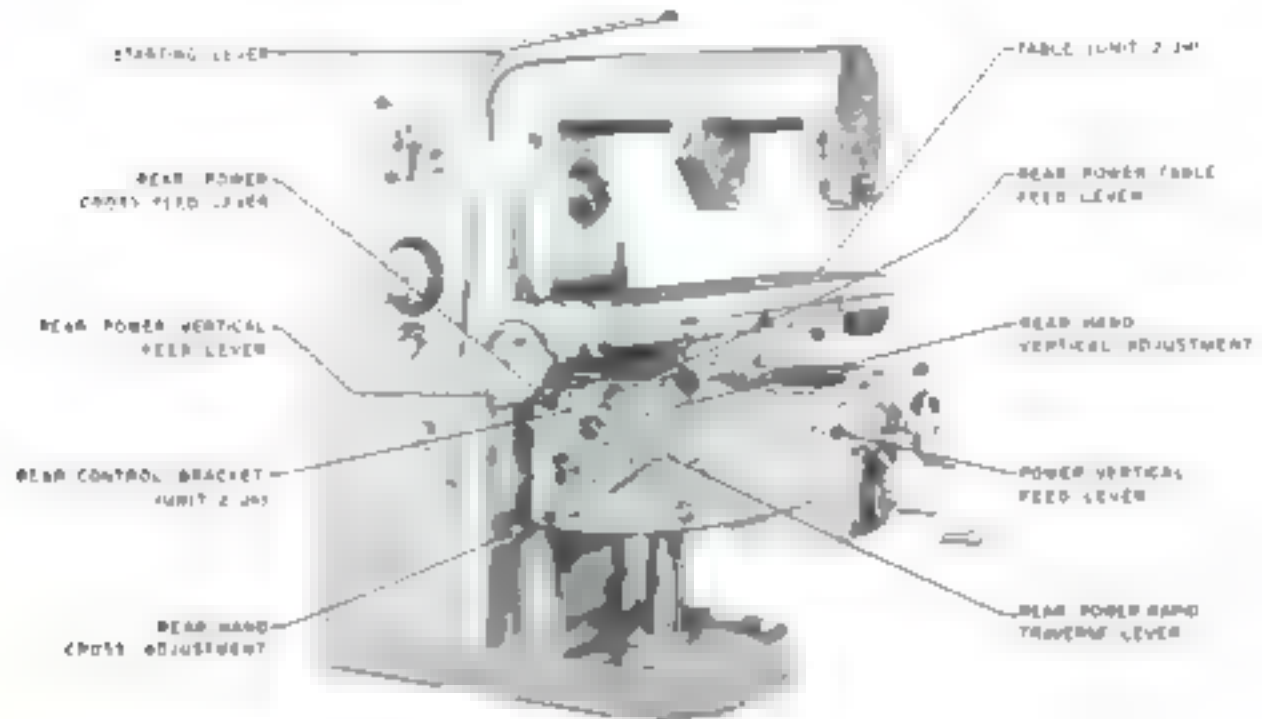
TYPE	SIZE	W	H	D	L	B	T	S	R	F	G	C	A	P	M	N	K	J	I	H	G	F	E	D	C	B	A
2ML	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2
2MI	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2	14-1/2

FUNCTIONAL DIAGRAM



FIGURES 82 and 8B
No. 2351 Vertical Machine

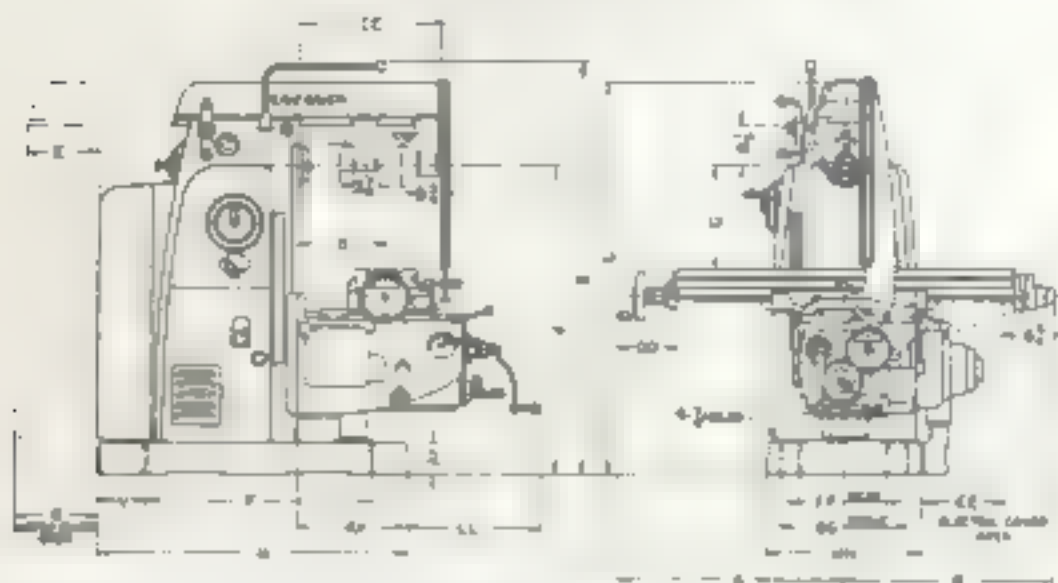
FUNCTIONAL DIAGRAM



FIGURES 10A and 10B
No. 1 MI Plain Machine

DIMENSIONAL DRAWING

No. 3MI Plain and Universal



SHADED SURFACE INDICATES
MAXIMUM CUTTING AREA



SPINDLE NOSE
STANDARD PLAIN END
SPIN ON IN POWER OFF

TABLE & T-SLOT



FLOOR PLATE

MACHINE SPECIFICATIONS										DIMENSIONS									
Model	2 ML	3 ML	3 MI	3 MI	3 MI	3 MI	3 MI	3 MI	3 MI	Overall Width	Table Width	Table Height	T-Slot Width	Spindle Nose	Spindle Nose	Spindle Nose	Spindle Nose	Spindle Nose	Spindle Nose
2 ML	100	100	100	100	100	100	100	100	100	200	40	44	4	4.000	3.750	3.500	3.250	4.000	4.500
3 ML	100	100	100	100	100	100	100	100	100	200	40	44	4	4.000	3.750	3.500	3.250	4.000	4.500
3 MI	100	100	100	100	100	100	100	100	100	200	40	44	4	4.000	3.750	3.500	3.250	4.000	4.500

FUNCTIONAL DIAGRAM

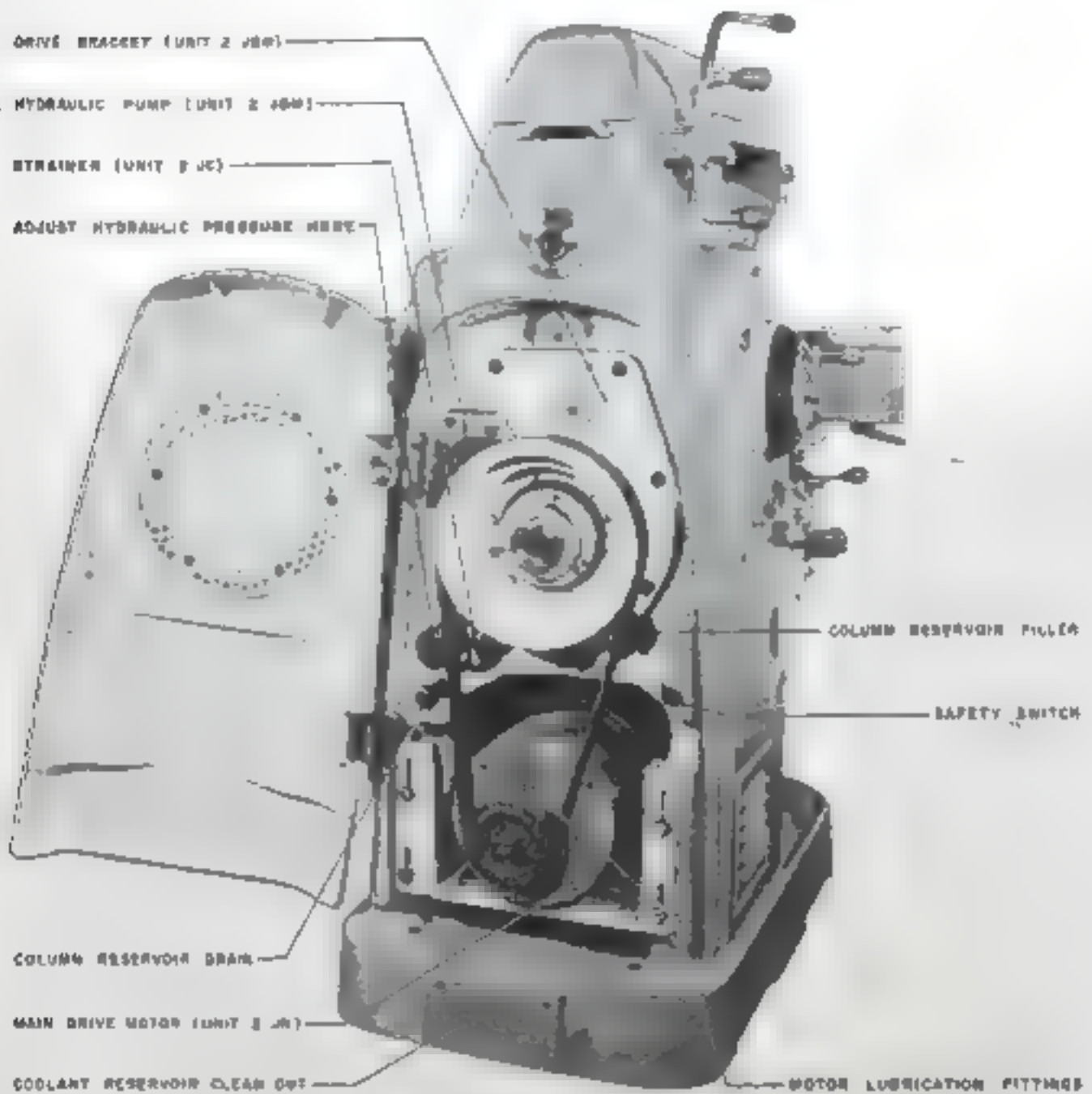


FIGURE 12

CONVERSION CHART

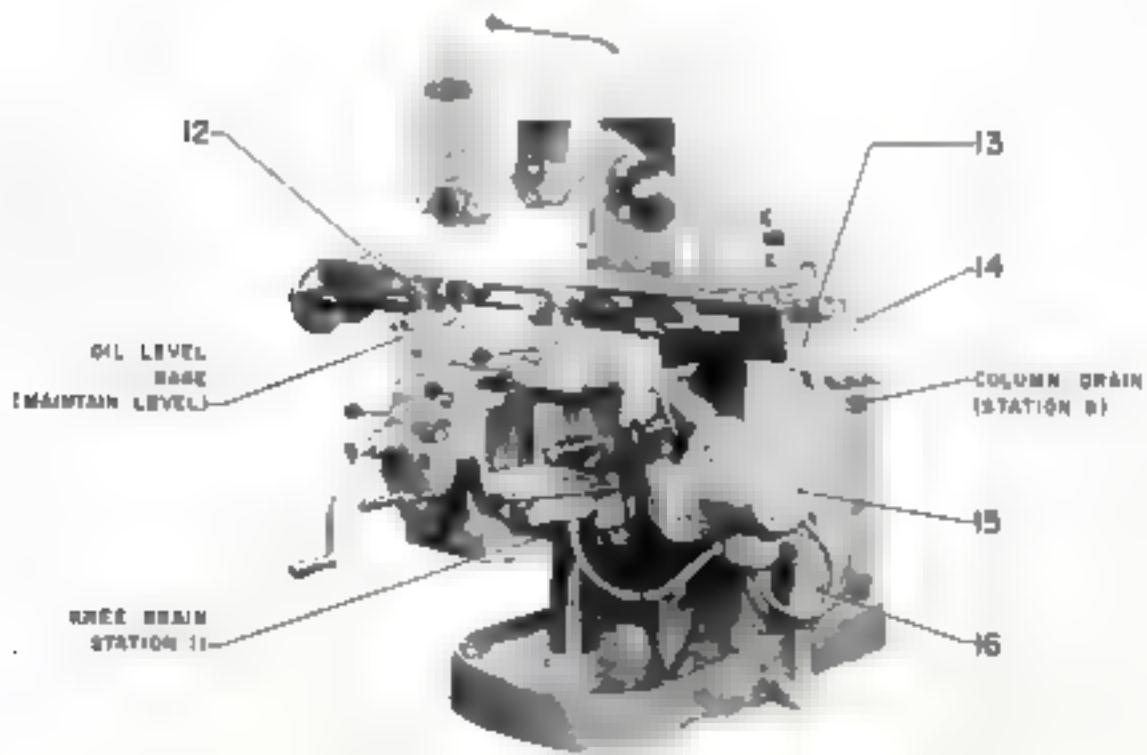
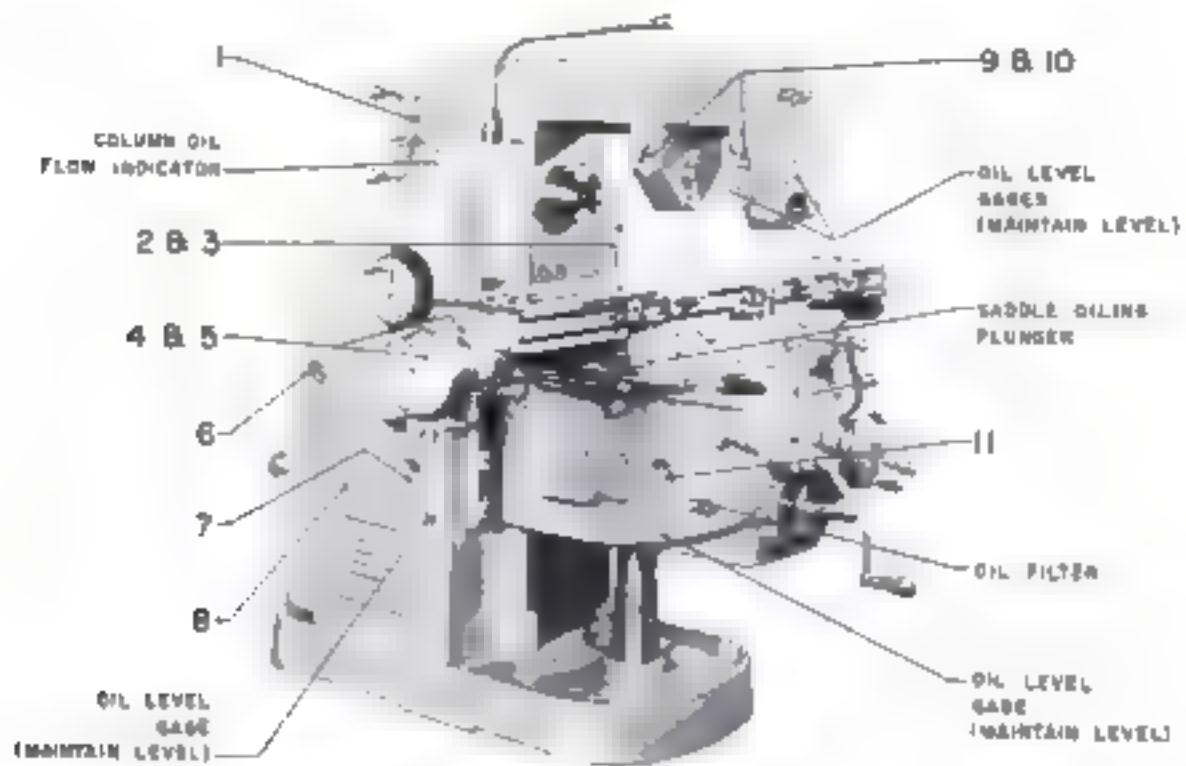
Based on 25.4mm = 1"

Inches into Millimeters

Inches	M/M	Inches	M/M	Inches	M/M	Inches	M/M	Inches	M/M
1/64	.0156	0.3969	49/64	.7656	19.4469	34	863.600	82	2082.80
1/32	.0312	0.7937	25/32	.7813	19.8437	35	889.000	83	2108.20
3/64	.0469	1.1906	51/64	.7969	20.2406	36	914.400	84	2133.60
1/16	.0625	1.5875	13/16	.8125	20.6375	37	939.800	85	2159.00
5/64	.0781	1.9844	53/64	.8281	21.0344	38	965.200	86	2184.40
3/32	.0938	2.3812	27/32	.8438	21.4312	39	990.600	87	2209.80
7/64	.1094	2.7781	55/64	.8594	21.8281	40	1016.00	88	2235.20
1/8	.1250	3.1750	7/8	.8750	22.2250	42	1041.40	89	2260.60
9/64	.1406	3.5719	57/64	.8906	22.6219	43	1066.80	90	2286.00
5/32	.1563	3.9687	29/32	.9063	23.0187	43	1092.20	91	2311.40
11/64	.1719	4.3656	59/64	.9219	23.4156	44	1117.60	92	2336.80
3/16	.1875	4.7625	15/16	.9375	23.8125	45	1143.00	93	2362.20
13/64	.2031	5.1594	61/64	.9531	24.2094	46	1168.40	94	2387.60
7/32	.2188	5.5562	31/32	.9688	24.6062	47	1193.80	95	2413.00
15/64	.2344	5.9531	63/64	.9844	25.0031	48	1219.20	96	2438.40
1/4	.2500	6.3500	1		25.4000	49	1244.60	97	2463.80
17/64	.2656	6.7469	2		50.800	50	1270.00	98	2489.20
9/32	.2813	7.1437	3		76.200	51	1295.40	99	2514.60
19/64	.2969	7.5406	4		101.600	52	1320.80	100	2540.00
5/16	.3125	7.9375	5		127.000	53	1346.20	101	2565.40
21/64	.3281	8.3344	6		152.400	54	1371.60	102	2590.80
11/32	.3438	8.7312	7		177.800	55	1397.00	103	2616.20
23/64	.3594	9.1281	8		203.200	56	1422.00	104	2641.60
3/8	.3750	9.5250	9		228.600	57	1447.80	105	2667.00
25/64	.3906	9.9219	10		254.000	58	1473.20	106	2692.40
13/32	.4063	10.3187	11		279.400	59	1498.60	107	2717.80
27/64	.4219	10.7156	12		304.800	60	1524.00	108	2743.20
7/16	.4375	11.1125	13		330.200	61	1549.40	109	2768.60
29/64	.4531	11.5094	14		355.600	62	1574.80	110	2794.00
15/32	.4688	11.9062	15		381.000	63	1600.20	111	2819.40
31/64	.4844	12.3031	16		406.400	64	1625.60	112	2844.80
1/2	.5000	12.7000	17		431.800	65	1651.00	113	2870.20
33/64	.5156	13.0969	18		457.200	66	1676.40	114	2895.60
17/32	.5313	13.4937	19		482.600	67	1701.80	115	2921.00
35/64	.5469	13.8906	20		508.000	68	1727.20	116	2946.40
9/16	.5625	14.2875	21		533.400	69	1752.60	117	2971.80
37/64	.5781	14.6844	22		558.800	70	1778.00	118	2997.20
19/32	.5938	15.0812	23		584.200	71	1803.40	119	3022.60
39/64	.6094	15.4781	24		609.600	72	1828.80	120	3048.00
5/8	.6250	15.8750	25		635.000	73	1854.20	121	3073.40
41/64	.6406	16.2719	26		660.400	74	1879.60	122	3098.80
21/32	.6563	16.6687	27		685.800	75	1905.00	123	3124.20
43/64	.6719	17.0656	28		711.200	76	1930.40	124	3149.60
11/16	.6875	17.4625	29		736.600	77	1955.80	125	3175.00
45/64	.7031	17.8594	30		762.000	78	1981.20	126	3200.40
23/32	.7188	18.2562	31		787.400	79	2006.60	127	3225.80
47/64	.7344	18.6531	32		812.800	80	2032.00	128	3251.20
3/4	.7500	19.0500	33		838.200	81	2057.40	129	3276.60

0.001" = .0254 mm

0.01 mm 0.0004"



FIGURES 14A and 14B
Lubrication Diagrams

LUBRICATION INSTRUCTIONS AND SPECIFICATIONS

(See Lubrication Diagrams, Opposite Page)

Thoroughly oil all moving parts as they are installed. Then lubricate all principal points as listed below before starting motor. Periodic and thorough lubrication with correct lubricant, as specified,

will help maintain the long life and accuracy built into machine. The intervals listed are based on a normal eight-hour day.

PURCHASE LUBRICANTS FROM RELIABLE DEALERS

Interval	Station No. and Part Lubricated	Lubricating Instructions		Lubricant Specifications
Daily (8 Hours)	1—Overhead idler wheel bearing	Fill oil cups.		CMMCo.—No. P-24 Rust and oxidation inhibited mineral oil Viscosity 200 to 220 SSU at 100° F
	2, 3—Knee—Column ways			
	5, 14—Lead screw bearings			
	11—Gears and bearings in head	Cap 7 Drain at 8 months	Check oil level daily Fill to high limit when oil drops to low limit	
	4—Column gears and bearings	Cap 2-1 3 gal Drain at 6 months	Check oil level daily Fill to high limit when oil drops to low limit	
	9, 10—Arbor support bearings	Cap 1-1 2 gal Drain at 6 months	Check oil level daily Fill to high limit when oil drops to low limit	
	12—Saddle parts and knee- saddle ways	Cap Approx 1 1 qt	Manual oil level be- tween high and low limits on gage TWICE DAILY pull out plungers at least 3 times and allow to return by itself each time	
	5, 14—Long lead drive shaft bearings	Fill oil cups	(Only when long drive mechanism is used)	
7—Vertical screw	Cap 1 quart	Check oil level daily. Fill to high limit when oil drops to low limit	CMMCo.—No. P-22 Hydraulic Slideway oil Viscosity 150 to 185 SSU at 100° F (Add more oil gear over slipstick level)	
Periodically	15—Knee drive motor bearings			
	6—Main drive motor bearings	See note below		
	16—Coolant pump bearings			

In above oiling interval use daily at 8 hours, monthly or 160 hours, 6 months or 1000 working hours; whichever comes first when machine is operated continuously.

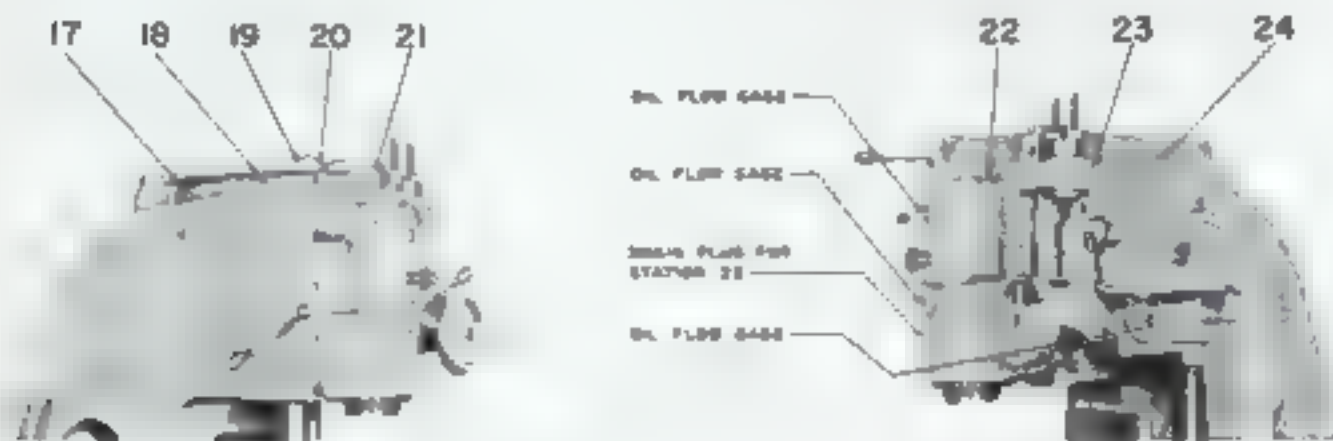
*Drain knee and column at end of first month and every six months thereafter. Cap. 2MI, 2ML: 1-1/2 gal.; 3MI: 2-1/2 gal.

Column oil strainer should be cleaned at least every time oil is drained. Remove strainer cover with a face spanner wrench, pull out strainer, wash in naphtha, blow clean with compressed air and replace.

Coolant Tank Capacity: 6 gallons (23 liters)

MOTOR LUBRICATION—As each customer selects his own make of motor it is impossible to give exact lubrication instructions here. However, all motor manufacturers have full instructions, which may be obtained upon receipt of motor serial number.

CAUTION—Lubricate periodically according to motor manufacturers' instructions. Do NOT over lubricate. Never allow a grease lubricated bearing housing to become more than 1/3 to 1/2 full of grease.



FIGURES 17A and 18B

LUBRICATION INSTRUCTIONS AND SPECIFICATIONS

2MI VERTICAL MACHINE ONLY

[See Lubrication Diagrams, Above]

Interval	Station No. and Part Lubricated	Lubricating Instructions	Lubricant Specifications
Daily (8 Hours)	18, 20, 21—Sliding ways in vertical head	Fill oil cups	CMMCo. — No. P-55 Rust and oxidation inhibited mineral oil.
	22—Bearings and gears in vertical head	Check oil level daily and refill to high limit when level drops to low limit.	Viscosity 200 to 220 SSV at 100° F.
Monthly (160 Hours)	17, 19—Counterweight sprocket shaft bearings	Inject 2 or 3 shots of grease from hand gun.	CMMCo. — No. P-37 16½-20½ calcium soap, Worked Penetration No. 230-250. Viscosity of oil used 100 to 115 SSV at 100° F.

INSTALLATION INSTRUCTIONS

To obtain accurate results from a milling machine, over a long period of time, three requirements must be met. First, foundation upon which the machine rests must be heavy enough to maintain stability and flatness under machine's weight. Second, machine must be carefully leveled and the level maintained by periodic checks. Third, machine should be anchored firmly to the floor.

Foundation

Special foundations for Cincinnati Nos. 2ML, 2MI and 3MI Milling Machines are not required. Any substantial floor, wood or concrete, fairly flat, and sufficiently sturdy to hold machine's weight without excess vibration, will be satisfactory. (The 2ML type machine weighs approximately 4000 lbs., the 2MI from 4500 to 5000 lbs., and the 3MI from 6000 to 6300 lbs.) Select a area free from extraneous vibration.

Lifting Machine

The plain and universal machines may be lifted by a crane with a rope or cable sling around the over-arm (Figure 17A). Center the overarm and lock in position before lifting.

The vertical machines may be lifted by a crane with a rope or cable sling around the throat (Figure 17B). Before lifting, run saddle forward on knee in balance machine weight.

If a cable or chain sling is used protect machine surfaces with leather or wood blocks.

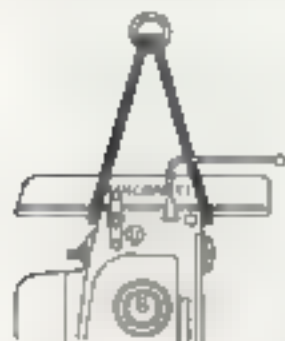


FIGURE 17A
Lifting Horizontal
Machine



FIGURE 17B
Lifting Vertical
Machine

Bolting Machine to Floor (Figure 17C)

When preparing for this operation, notice that center distances of bolt holes given on "Dimensional Drawings" are approximated. If the floor is concrete, drill the bolt holes about 6" in diameter. Insert the four hold down bolts through 1-1/2" pipes as illustrated in Figure 17C, and fill each pipe with dry sand. Lower machine on two 1" thick boards and engage a nut sufficiently to hold each bolt. Fill the holes around pipes with quick drying cement, thin enough to flow easily. When cement is dry, remove boards, level machine and tighten hold down bolts.

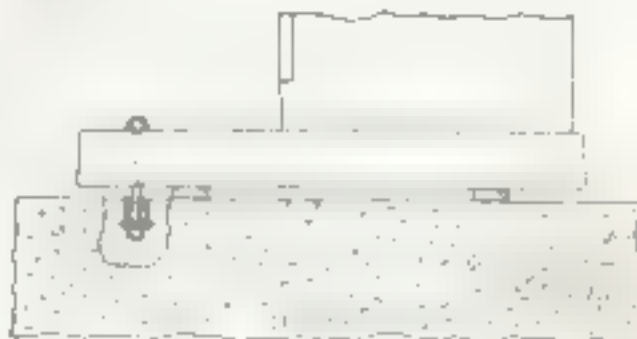


FIGURE 17C
Bolting Machine to Foundation

Leveling

For leveling machine tools, a sensitive, graduated tube spirit level, reading to 1/32 seconds per graduation (.0005" per foot) and provided with screw adjustment, is required. A carpenter's level or the bulb in a machinist's combination square is not good enough. Table must be clean and free of burrs. Place laminated shims under corners of base until machine is level in all directions. Now place additional shims under base to evenly distribute weight of machine and recheck for level. Check and adjust machine level periodically.

Cleaning

The machine should never be cleaned with a blast from an air hose as it will drive grit and dirt into ways and bearings. Use only lint-free rags for plain surface and a stiff bristle brush for corners. Prevent formation of permanent stain by periodic cleaning.

ADJUSTMENTS

To Adjust Gibs (Figure 18A)

Headless type taper gibs are provided to compensate for wear of bearing surfaces between sliding elements at knee and column, saddle and table, vertical head and column. Keep these sliding surfaces clean and well oiled to prevent undue wear.

1. Set power feed engaging lever of the unit containing gib to be adjusted, in a neutral position.
2. Turn Adjusting Screw in a clockwise direction to force gib in until hand movement of slide is tight, but not locked, then back off screw approximately one full turn. This setting should allow free movement of unit by handwheel with only a slight drag.

CAUTION -- Too tight adjustment of gibs squeezes out the oil film, causing undue wear and scoring.

Do not adjust gibs as a cure-all for vibration. Check cutter design (rake and clearance angles, etc.), nature of work, cutter rpm and feed before adjusting gibs.

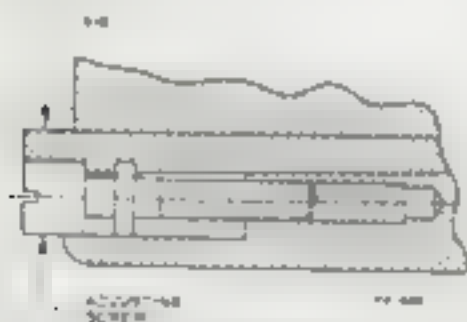


FIGURE 18A

Section Through Headless Type Gib for Knee

To Adjust Table Lead Screw Bearing (Figure 18B)

The table lead screw operates in two tapered roller bearings at right end and a bronze bushing at left end. When machine leaves our factory the clearance between lead screw and nut, at gib and in bearings, is such that dial at handwheel has approximately 0.005" rotary play. This backlash will increase if roller bearings become loose or feed screw nut wears.

1. Loosen gib by backing off adjusting screw, at left end of table, a few turns.

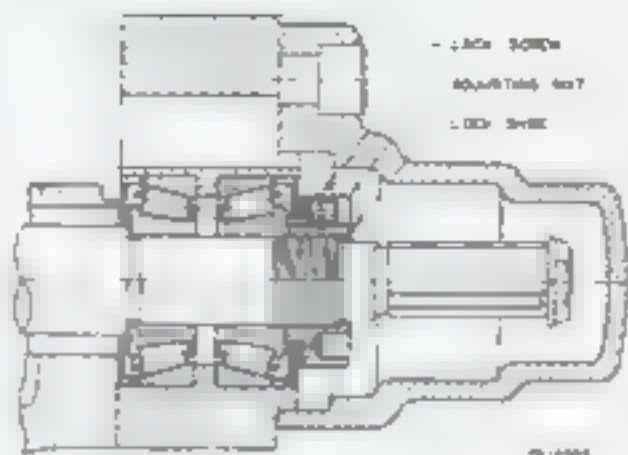


FIGURE 18B

Section Through Right Table Apron

2. Remove bell shaped cover from right end of table. Loosen Lock Screw in Adjusting Nut and tap screw to loosen Lock Shoe. Tighten adjusting nut with a facetype spanner wrench, and then back off approximately 1/16 turn. Tighten lock screw and replace cover.
3. Turn table handwheel by hand to "feel" bearing setting. It should not have been tightened to the point at which it is hard to turn wheel but there should be no play in bearing.
4. Readjust gib.

After bearing adjustment is satisfactory any residual backlash above 0.005" will indicate a worn table lead screw nut that should be replaced if necessary.

To Adjust Driving Clutch (Figure 19A)

The adjustment for main driving clutch is located inside driven sheave. If cutter won't maintain its set speed under a normal load, the clutch is slipping and needs adjustment. If, when the starting lever is engaged with the spindle set for high speed, the spindle hesitates in coming up to full rpm, the clutch is slipping and needs adjusting.

1. Open motor compartment door.
2. Pull out spring loaded Drive Clutch Adjusting Pin and with it turn adjusting yoke clockwise



FIGURE 10A
View Into Rear of Column

until spindle starting lever requires distinct pressure to engage. Release pin and slowly rotate yoke counterclockwise until pin drops into a locking hole. Close motor compartment door.

If spindle continues to rotate after starting lever is shifted to stop position, the clutch is too tight and should be freed by pulling out pin and rotating yoke counterclockwise one hole at a time.

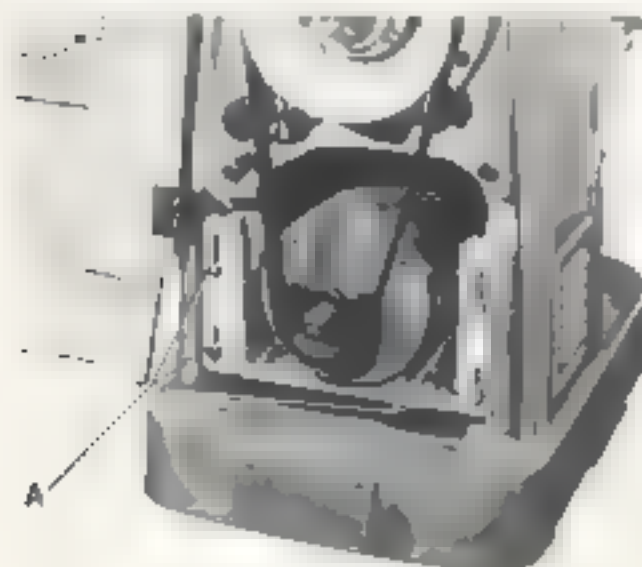


FIGURE 10B
Motor Drive in Rear of Column

To Adjust Main Drive Belts (Figure 10B)

Make certain that driving and driven sheaves are in line when motor shaft is at mid position of end play. A V-belt drives through side contact of belt and sheave so it need not be excessively tight. Check belt settings frequently, every few days, until new belts are set to machine and occasionally thereafter. (Keep oil and grease away from belts. Never apply belt dressing to V-belts.) If V-belts slip due to stretch or wear, they can be tightened as follows:

1. Open motor compartment door.
2. Loosen four cap screws "A" and allow motor to settle into belts. Tighten cap screws and close motor compartment door.

To Adjust Cross Screw Bearing (Figure 10C)

The front end of cross feed screw operates in two tapered roller bearings while the rear end is supported by straight roller bearings. When machine leaves our factory the clearance between feed screw and nut, at gib and in bearings, is such that dial at handwheel has approximately 0.005" rotary play. This backlash will increase if roller bearings become loose or feed screw nut wears.

2. Loosen gib by backing off gib adjusting screw, at right side of knee-saddle ways, a few turns.

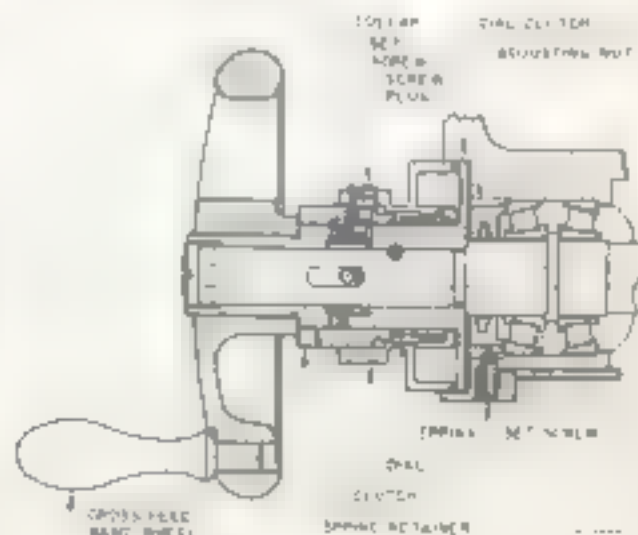


FIGURE 10C
Section Through Cross Screw

2. Remove slotted center screw and slip Cross Feed Handwheel off cross screw. Remove Screw Plug to dial and turn dial until plug hole is in line with Set Screw in Spring Retainer. Remove set screw from retainer and slip Retainer, Dial and Spring from end of cross feed screw.
3. Drive tangential taper pin from Dial Chuck, remove through screw from Collar and slip Collar and dial clutch from cross feed screw.
4. Remove locking Set Screw from side of base on knee, turn in Adjusting Nut until tight then back off one slot.

Replace all parts and turn cross feed screw by hand to "feel" bearing setting. It should not have been tightened to the point at which it is hard to turn handwheel but there should be no play in the bearings.

5. Readjust gib.

After bearing adjustment is satisfactory any residual backlash above 0.003" will indicate a turn cross feed screw nut that should be replaced if necessary.

To Adjust Backlash Eliminator (Figure 30A)

Normally the mechanism is self compensating for wear so should not require adjustment for many months.

Any need for adjustment of the backlash eliminator will be indicated by:

- (a) Lunging table movements while climb milling indicates that the backlash (B/L) eliminator nuts are loose or worn and need adjusting. Normally the knurled actuating knob at front of saddle should turn rather easily over most of approximately 5 turns from fully engaged to fully disengaged. If it turns stiffly through the entire range this is another indication that B/L mechanism needs adjusting.
- (b) Difficult manual operation of table might indicate too tight an adjustment.

The backlash (B/L) eliminator should be adjusted as follows:

1. Remove right and left aprons from table per paragraphs 1 through 3 on page 27 under To Remove Table and Lead Screw. Pencil mark location of table gib, (for ease in resetting) loosen it slightly and slide table to right far enough to uncover backlash nuts. Support outer

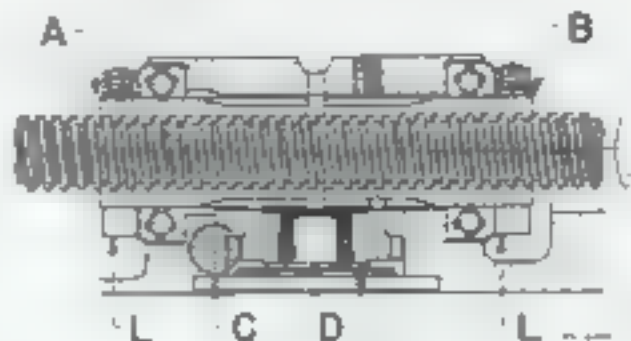


FIGURE 30A

Section Through Backlash Eliminator

end of table as it is being moved to right.

2. Set B/L actuating knurled knob at front of saddle in disengaged (fully out) position. (There are approximately 5 turns from fully engaged to fully disengaged).

Loosen set screws, tap to loosen lock shoes under screws and tighten backlash nuts (L) so they are snug against their thrust bearings. Normally only a fractional turn of nuts is sufficient. With a rag around leadscrew it should be possible to rotate screw by hand. When knurled knob is turned in 2 to 2-1/2 turns it should be impossible to rotate leadscrew by hand but it should be possible to turn knurled knob in another 2 to 2-1/2 turns to make backlash fully effective.

It may be necessary to further tighten or slightly loosen backlash nuts (L) to obtain correct setting. Tighten set screws to lock nuts.

3. Slide table back into position, mount both aprons, adjust table lead screw bearings and reset table gib.

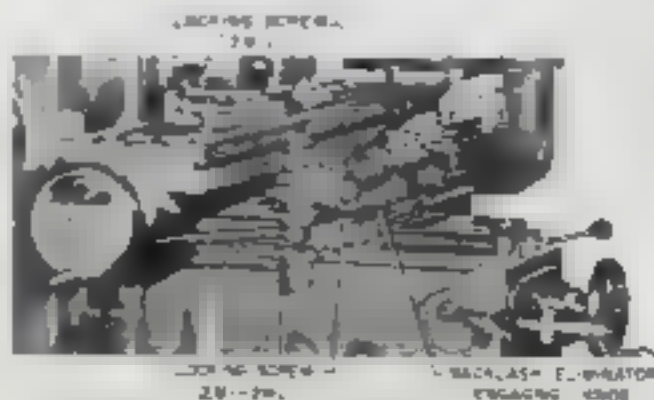


FIGURE 30B

Saddle and Housing - Universal Machine

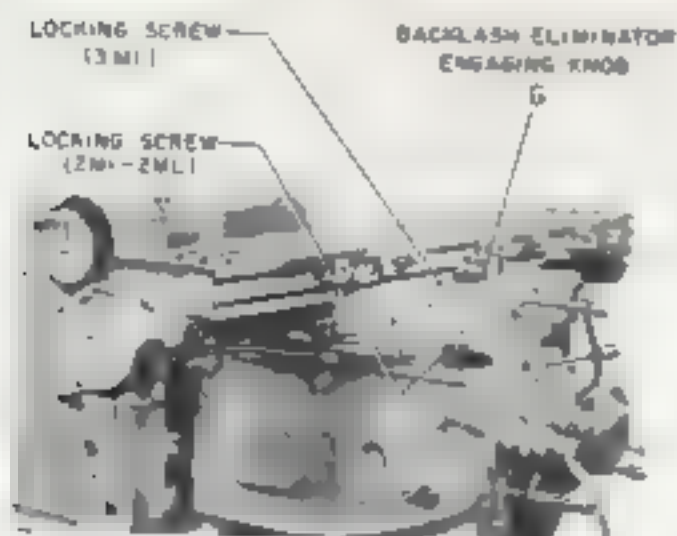


FIGURE 21
Knee and Saddle--Plain Machine

To Adjust Hydraulic Oil Pressure (Figures 6A and 12)

If gears in shifter bracket clash when changing speeds, shift improperly, or fail to shift, it is an indication that oil pressure is low.

Oil pressure should be checked periodically and, if necessary, adjusted as follows:

1. Make certain column oil level is correct. Remove 1/2" pipe plug from bushing at top center of gear shifter bracket and install a 500-in. pressure gage.
2. Open rear door, unscrew 1/4" pipe cap from nipple at left of pulley bracket and remove locking set screw from inside nipple. Start machine and adjust set screw in nipple until pressure on gage registers 200-220 psi.
3. Replace locking set screw, pipe cap and 3/4" pipe plug.

To Adjust Arbor Support Bushings

Looseness that would cause unevenness of finish, or possibly chatter, would indicate necessity for bearing adjustment. An overly hot arbor would indicate too tight a bearing that should be relieved.

The bushing, mounted in a tapered bore, is closed

around arbor journal as it is pulled into arbor support by a nut or screw.

1. Start machine, set highest spindle speed at gear shifter bracket and set reversing lever under speed dial in neutral (center) position. Place starting lever in stop position.
2. Rotate spindle and arbor by hand to feel torque required. Turn lock roller (198A) until flat on roller faces arbor bushing adjusting nut (199A). (See page 118.) Tighten adjusting nut, while rotating spindle by hand, until a slight drag is felt as bushing is squeezed around shaft. Lock adjusting nut by rotating lock roller to engage a serration on nut.
3. Make certain that arbor reservoir contains sufficient oil.

To Adjust Dyanpoise Overarm

The dyanpoise overarm used with this machine has been set at our factory to prevent cutter chatter under most conditions. However, under very adverse conditions, if chatter occurs, the overarm should be readjusted as follows:

(Before changing overarm setting make certain gibs, clamps, fixtures, and lead screw bearings are set correctly. Also see that speeds, feeds and cutters are correct for the cut--sometimes a heavier chip per tooth will help.)

1. Remove screw from name plate at front of overarm and swing plate down on pin at opposite end. Remove lock key (172A) from adjusting rod (162A) under plate. (See page 118.)
2. While machine is running in cut, tighten or loosen, by rotational increments of 1/4 turn, adjusting rod to overarm until chatter disappears. Replace lock key and name plate.

CAUTION -- Never leave adjusting rod locked tightly against internal compression spring. Rod must, at all times, be free enough to be rotated a few turns in either direction.

To Adjust Spindle Bearings

If, when face milling, the work piece shows steps between cuts, it would indicate excessive spindle

end play provided the cutter is sharp and true. Excessive end play might also be indicated. **It is impossible to mill a long straight slot. (Before adjusting spindle bearings make certain that gibs are correctly adjusted as loose gibs could cause these same errors in cutting.)**

1. Set the spindle reversing lever on face of shifter bracket in neutral position so spindle will rotate easily.
2. Remove two driving keys from face of spindle and insert a 1" wide flat steel piece approximately 12" long in key slots.
3. **HORIZONTAL MACHINES**--Move overarm forward on machine until rectangular plate under it can be lifted from top of column. Move overarm with pilot wheel then pull further by hand. Support front end of overarm while it is in this forward position. Remove plug "A". (Figure 22A.)



FIGURE 22A
Section Through Horizontal Spindle

VERTICAL MACHINES--Remove pipe plug from left side of vertical column, just below back gear lever.

4. Insert a long handled socket head key into 1/2" locking set screw in spindle bearing adjusting nut. Loosen screw and tap to loosen lock shoe under it.
5. Insert a 3/8" diameter bar into a radial hole of adjusting nut and, using flat bar in key slots,

rotate spindle counterclockwise a revolution, then clockwise until bearings are snug and finally counterclockwise again approximately 25 inch on circumference.

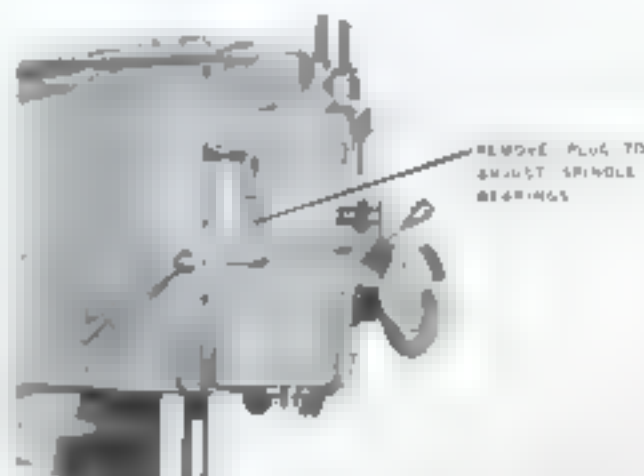


FIGURE 22B
Left Side of Vertical Head

6. Tighten locking set screw and remove screw key. Rotate spindle by hand to seat bearing and feel the bearing setting. Replace pipe plug in side of vertical head, on Vertical Machines and rectangular plate at top of column on Horizontal Machines. Push overarm back into place. Replace driving keys in spindle.

Machines that are used for general purpose work should have approximately .001" end play in spindle bearings. Machines that are used for high-speed work exclusively should have approximately .002" end play in spindle bearings. Check end play by mounting a 1/10,000" indicator so its stem contacts spindle nose and lightly tapping spindle forward and back while reading indicator.

If spindle runs hot the bearings have been set too tight. Check actual temperature by placing a thermometer in a spindle tap screw hole. Normally the recorded temperature should never exceed 115-120°.

DISMANTLING INSTRUCTIONS

To Remove and Dismantle Shifter Bracket (Figures 8A, 23A)

1. Start machine and run spindle at 115 rpm. (This speed sets 115 rps in shifter bracket at best position for reinstalling bracket into column--top forks together and center forks spread apart.) Place spindle reverse lever in "Spindle Run Left" position. Disengage spindle starting lever and stop machine.
2. Remove nine cap screws from around shifter bracket. (Top four screws are longest, two center screws are medium length and three bottom screws are shortest.)
3. Remove 1/2" set screw from center of top edge of shifter bracket and insert an eye bolt into hole. Attach a crane to eye bolt and remove slack from cable.

Tap around outside of bracket to break seal, work bracket straight out from column off oil tube at top and lift out of column with crane.



FIGURE 23A
Removing Shifter Bracket

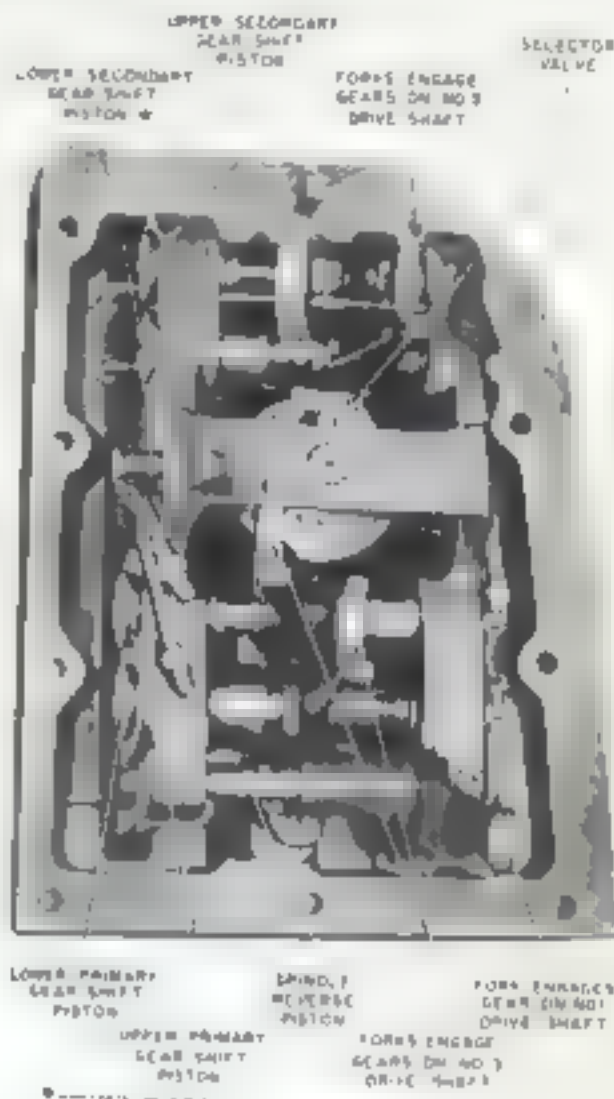


FIGURE 23B
Rear of Shifter Bracket

Before reinstalling, clean contact faces of bracket and paint with sealing compound. Swing bracket squarely into place so it rests on front edge of shell under opening. Check through top edge to make certain that forks align with grooves in gears and oil tube at top edge will enter hole in bracket. Push bracket squarely into place, onto taper of oil tube, and fasten with one cap screw at top and one at bottom.

Start machine and check spindle speed and spindle reverse to make certain forks are engaged correctly. Fasten bracket with remaining seven screws.

4. Forks 60A, 75A, 86A and 92A can be removed after unscrewing end plugs (56A, 68A, 77A, 89A) and removing straight pins through forks and plungers. It is necessary to remove fork 60A before 75A and fork 92A before 86A. (See page 42.)

A ball locking device under forks 75A and 92A locks one fork in neutral while the other is moving. Racks (43A and 50A, page 40) under 1.2" dia. balls (48A, 52a) should engage the compensating pinion (42A) so that when top of one ball is flush with the surface the other ball protrudes slightly over $\frac{1}{3}$ its diameter. A fitted 7.18" diameter brass spacer (51A) approximately 5.18" thick is between upper ball and its rack. Lateral movement of compensating pinion is prevented by a dog point set screw (50A) that enters a groove in pinion.

5. Tag and remove all tubing. Remove set screw, selector valve descent (59A) and locking set screw at rear of selector valve shaft (11A). Unscrew capstan lock nut (17A) and remove dial (18A) from front of bracket. Tap shaft (11A) and remove selector valve (27A, 26A, 25A, 22A) assembly. Speed change crank (2A) and reduction gearing are held in place by three small screws. Internal gear (20A) is pinned with a straight pin.

To Remove and Dismantle Main Drive Bracket (Figure 24 and pages 106, 108)

1. Loosen clamp screws and raise main drive motor so belts can be removed.
2. Proceed as per paragraphs 1 through 3, under "To Remove and Dismantle Shifter Bracket", page 23.
3. Remove five 3/8" cap screws and one 5/8" cap screw holding the pump body (62A) to the drive bracket, and remove pump. On ZML MACHINES the driven sheave (103A, page 108) must be removed from its hub (104A) by removing six screws (110A) before pump body (62A) can be removed.

The filler pipe fitting at the lower right side of the drive bracket (as viewed from the rear of the machine) must be turned out of the way to make room for removing the bracket.

4. Remove the remaining six screws through flange of drive bracket. Put a rope sling around hub of driven sheave, as close to bracket as possible, attach to a crane and remove stack. Insert two steel bars, 7/8" dia. and approximately

3' long, into bottom holes of bracket flange to counterbalance bracket weight as it is removed from column.

5. With a brass rod, tap around inside of bracket flange to break seal and start it off double diameter locating pins (38A) through flange, and pilot (27A) at top front of bracket. Work the bracket straight out of column. (See pages 106 and 108.)

Before assembling, clean and seal mating surfaces of bracket and column. Work bracket into column so pilot enters its bored hole and straight pins enter holes in column. Make certain that clutch operating lever engages detent on vertical spindle starting shaft, pump idler gear meshes with pump drive gear in column and 4th shaft gear engages column gear. Pull drive bracket into column with screws through flange. Replace pump and straighten filler pipe fitting. Replace driven sheave (103A) on ZML MACHINE.

6. To remove No. 4 drive shaft (23A)--take off bracket pilot (27A) and shoe type lock nut (26A) under it; remove snap ring (1A) from opposite end and straight pin through gear (4A). Tap shaft toward rear out of its bearings. Pilot is sliding fit in bracket.
7. To remove No. 1 drive shaft (113A) with clutch--remove spanner nut (76A), brake plate housing (73A), spanner nut (69A), brake assembly (65A, 72A) and straight pin (114A). Through hole in sheave (103A), remove screws (112A) from flange of sleeve (108A). Through bracket tap sheave sleeve (108A) to break seal at flange.

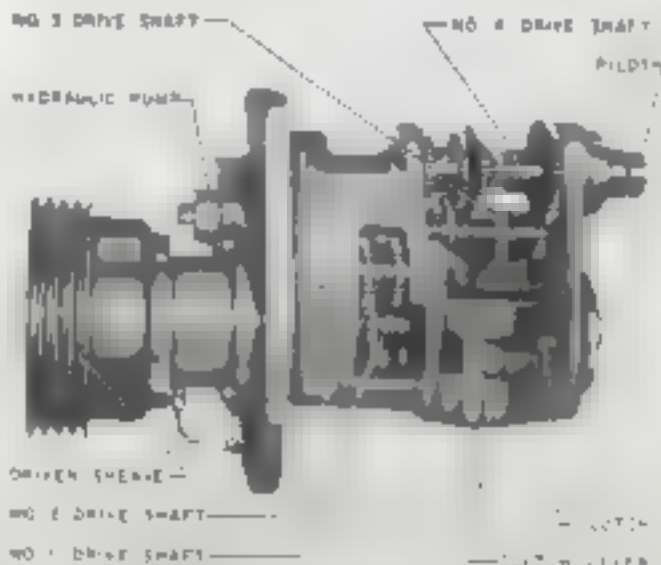


FIGURE 24 - Main Drive Bracket

Sheave sleeve assembly with drive shaft can now be pulled out of bracket.

To remove main drive clutch--unscrew nut (127A), slip off cone ring (122A), pull out latching pin and unscrew roller finger holder (123A). Unscrew set screw from clutch hub and slip hub from spline. (This can be done easier if driven sheave is first removed.)

8. To remove No. 3 drive shaft (10A) it is first necessary to remove No. 1 drive shaft per paragraph 7 on page 14. Remove soap ring (22A) and straight pin from collar (21A) outside of pump roller gear (19A). Remove No. 4 hexagon head taper pin (16A) from side of bracket and pull stud (17A) out of bracket. Stud is tapped 1/8-16 to aid removal. Unscrew shoe type lock nut from outer end of No. 3 drive shaft and pry off gear (9A). Remove shoe type lock nut (33A) from outer end of shaft, and tap shaft out of its bearings.
9. To remove No. 2 Drive Shaft it is first necessary to remove No. 1 drive shaft per paragraph 7 on page 14. Remove No. 6 hexagon head taper pin and pull eccentric plug (40A). (Plug is tapped 1/2-13 to aid removal.) Remove No. 8 hexagon head taper pin and push out eccentric stud (43A). When assembling, use eccentric stud to correctly mesh gears on Numbers 1, 2, and 3 drive shafts. Then lock in place by driving in eccentric plug.

To Remove and Dismount Feed Drive Bracket (Feed Box) (Figures 25A, 25B and page 46)

1. Remove 1/4" pipe plug (24A) and 3/8" cone point set screw (26A) from face of drive bracket under knee. Shine light through hole and turn

feed change crank until milled slot in primary cam faces hole.

Screw 3/8" set screw into milled slot to prevent rotation while bracket is out--if primary cam will not be removed. Approximately 2-1/2 full turns of set screw are necessary to engage slot. Make a note of feed rate or lock feed change lever in position to simplify assembly.

It will be necessary to disengage the cam locking set screw before feed change lever can again be rotated after reassembling. If this bracket was removed without locking primary cam it may be necessary to synchronize gearing with feed dial. See page 21, under "To Remove Feed Dial Assembly from Knee."

2. Remove six of the eight cap screws and the two hexagon head taper pins that fasten feed bracket to knee. Loosen the two remaining screws and tap flange to break seal. Elevate knee to within approximately 11" of topmost position then block up under bracket. Remove two remaining screws, elevate knee until clear of bracket and slide bracket forward on blocks.

Before assembling paint flange with a sealing compound.

3. Nos. 1, 2 and 3 shafts can be removed independently after unscrewing castellated nuts. Nos. 1 and 2 shafts are slipped out from front to rear of bracket. Number 3 shaft is slipped out of bracket from rear toward front of bracket.
4. Remove soap ring (14A) and set screw that locks primary cam (18A) on its shaft. Tap shaft (5A) out of bracket from rear toward front. (See page 46.)

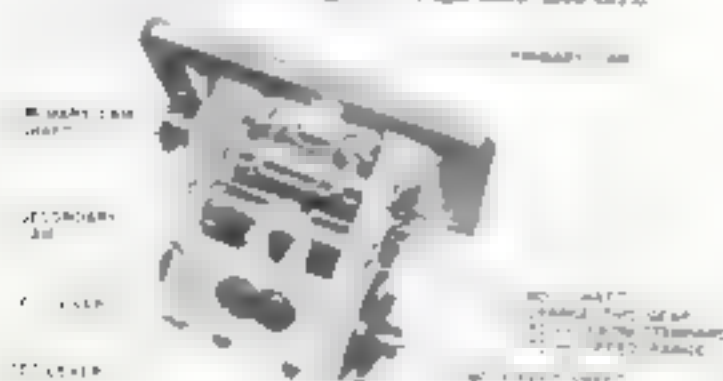


FIGURE 25A
Front of Feed Box

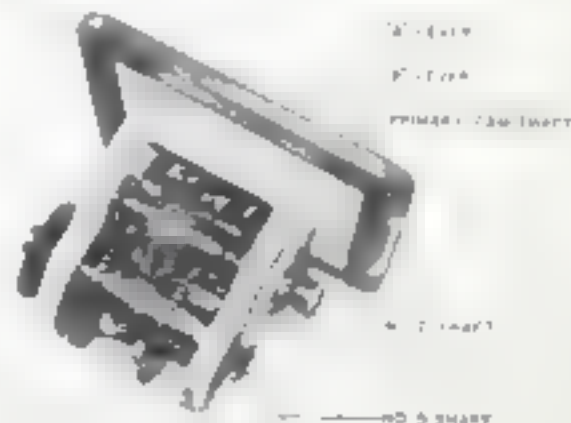


FIGURE 25B
Rear of Feed Box

5. Loosen lock nuts and remove screws that lock secondary cam studs (10A and 15A) to bracket. Pull studs from bracket and lift out cam (12A). (Studs are tapped 1/8"-16 as aid for removal.)

These studs, with their shoulders bearing against secondary cam, are used to locate the 3rd drive shaft gearing in relation to meshing gears on 2nd shaft. Studs are spot drilled to receive points of locking set screws.

To Change Feed Range from 1/4-30 to 1/2-40

Proceed as per instructions on page 25, under "To Remove Feed Drive Bracket." Remove rear control bracket (621A) or pump bracket (591A) from left rear of knee. (See pages 58 and 72.)

Loosen set screw, tap to loosen kick shoe underneath, and remove lock nut (623A). (See page 72.) Remove gear (622A), tap feed box drive gear (617A) toward the front of the knee and remove it through the feed drive bracket opening. The standard (1/4 - 30) feed rate is obtained with a 17-tooth gear while high (1/2 - 50) feed rate is obtained with a 26-tooth gear.

Remove gear from No. 1 shaft of feed drive bracket. (Figure 25A). Standard feed rate is obtained with a 35-tooth gear while high feed rate is obtained with a 26-tooth gear.

To Remove Cross Screw from Knee

1. Run saddle about half way back on knee and remove front sliding plates from right side of knee. (See Figure 9.) Place a wooden block between column and back of saddle.
2. Remove slotted center screw from cross feed handwheel (71A) and remove handwheel with its dog clutch (72A). (See page 50.) Remove slotted screw from knurled section of dial (84A), loosen socket set screw in retaining spring bushing (83A), under dial, and, remove bushing from inner clutch.
3. Unscrew headless screw (78A) and remove outer clutch knockout collar (85A). Drive out taper pin and remove inner clutch (78A). Remove set screw through side of knee and remove bearing

adjusting nut (79A). Through opening at right side of knee, under front sliding plates, unscrew slotted screw through inner clutch knockout collar (91A).

Replace and pin inner clutch (78A). With handwheel in place turn cross screw clockwise to remove it from knee.

4. When assembling, have saddle at front of knee and insert cross screw by hand. When screw is nearly fully entered the splines will catch on grooves in cross screw sleeve. As this alignment is felt, push knee back on saddle by hand so spline is fully engaged.

To Remove Front Elevating Shaft

1. Remove rear control bracket or rectangular plate from rear left side of knee. Remove feed drive bracket from bottom of knee, per instructions on page 25. Remove two cap screws, tap mounting plate to loosen taper pins, and pull power vertical feed lever from left side of knee. (See Figure 4.)
2. Unscrew 1/2" set screw (130A), with lockout, from left side of knee. (See page 52.)

Through bottom opening, extract cotter key and remove vertical pin (136A) from brake hub (142A) on front elevating shaft. Slide brake back along shaft, extract horizontal pin (141A) from rear of brake shoes, open shoes and remove. (When assembling, make certain that set screw engaging slot in hub is down.)

3. Remove crank (112A) from elevating shaft (127A). Unscrew set screw from spring sleeve (123A) at front of shaft and remove sleeve, spring and dial (116A).

Remove headless screw and slip knockout collar (117A) off shaft. Extract taper pin and remove dial clutch (120A). (Dial clutch flange has two 3/8" tapped holes for jack screws if necessary.)

Remove three cap screws and pull bearing retainer (122A) from front of knee. Screw a 3/8" rod, with a slidable weight and nut on outer end, into front of elevating shaft and hammer shaft out of knee.

To Remove Feed Dial Assembly from Knee

Drive taper pin (280A) from lever. (See page 58.) Remove two set screws (281A), (282A), through bottom of boss on knee. Remove set screw (277A) from center of pinion (278A), screw in a 1/4 - 20 rod and pull feed dial assembly from knee.

To remove interconnecting pinions (288A) (286A), it is necessary to first remove feed drive bracket from knee per instructions on page 25.

If drive bracket had been removed without cams being locked per instructions on page 25, under "To Remove Drive Bracket", it may be necessary to synchronize its gearing to that of dial assembly. With machine running, rotate feed change crank until slowest feed is obtained. If crank is not engaged in either of two holding holes in flange proceed as follows:

Remove handle assembly, remove center set screw (277A) from pinion shaft and loosen locking set screw under hub. Screw a 1/4 - 20 threaded rod into shaft and push back far enough to clear its meshing gear. Rotate pinion until taper pin hole through shaft is at right angles to holding holes in plate (273A) on knee, pull pinion forward into mesh and lock, replace crank and insert taper pin.

To Remove Table and Lead Screw

1. Take off bell shaped cover (423A, page 92) at right end of table (375A, page 90). Loosen lock screw, tap to free lock shoe under it, and remove bearing adjusting nut (367A). Remove four screws, tap apron (429A) to break sealed joint and slide right apron, with its two double diameter dowel pins, off lead screw (364A).
2. Remove slotted center screw (389A) and slip hand wheel (391A), outer clutch (402A), and spring from left end of lead screw. Remove screws from opposite sides of dial (408A) and rotate dial until screw holes are aligned with pin through inner clutch (410A) and lead screw. Drive out pin and remove inner clutch and clutch dial. Remove four screws, tap apron (412A) to break sealed joint and slide apron with its two double diameter dowel pins and lead screw bushing, off lead screw.
3. Unscrew gib screw at left end and remove table gib (388A, page 90). (If gib setting was correct,

it will facilitate assembly to pencil mark gib on edge of table before removing.) Fasten an eye clamp to center slot of table, relieve weight of table with a crane and slide it out of V-ways. Entire length of table must be supported as it is removed if no crane is available. (Left apron could be left in place and table removed from right to left.)

4. Run lead screw out of nut (361A) in saddle (housing on universal machines) from left to right. Support lead screw as it is removed, either by power or hand.

Lead screw can be removed without taking off table after right apron has been removed and apron and dial and inner clutch have been taken off left end.

If machine is equipped with a backlash eliminator the table should always be removed before lead screw. When assembling, always have lead screw in place in backlash nuts (365A) before sliding table into place. Backlash nuts must be held in place as lead screw is entered.

Run lead screw into nuts until it bottoms against shoulder, back off and lock with nut at right end so there will be .005" backlash on handwheel dial at left end.

5. Table can be moved far enough to right to work on backlash nuts, as follows:

Run table about 1/3 its travel to left. Remove screws from left apron and tap to break seal. Remove bell housing and lock nut from right end of lead screw, slide table to right along its ways until backlash nuts are uncovered. Be certain to support table as it is pulled out and block up under overhang.

To Remove Universal Housing from Saddle (See pages 82, 84 and 86)

Remove universal clamp screws and wedges (254A, 256A, 305A, 315A) from front and rear of universal housing (244A). Advance saddle to front of knee and retract overarm. If table is in place, center it and with a sling around ends of table lift housing straight up off center boss of saddle (186A) and four saddle housing clamps (253A, 309A). If table had been removed use a sling around right rear and left front corners of housing.

When assembling make certain that clamps are turned so clamping grooves face out and insert wedges with bevel on end turned up. Housing must be set down squarely on clamps and center boss of saddle. Gearing will start to mesh just as center boss enters bore in housing.

To Remove Saddle from Knee

1. Proceed as per paragraphs 1 through 3, page 28, under "To Remove Cross Screw from Knee."
2. Unscrew set screw (167A) from front of knee and lift power crossfeed lever (175A) and detach assembly from top front of knee. (See page 34.) Saddle cannot be removed with this lever in place.
3. Remove five cap screws (23A, page 76) and tap cross feed nut bracket (24A), with crossfeed nut (95A, page 30) in place, from the under saddle bracket (19A, page 70). Remove three cap screw (52A-1, page 48) that fasten rear sliding plates to inside of under saddle bracket.
4. Remove four screws (43A, page 76) from cover (42A) to disconnect telescopic spline shaft guard from rear of under saddle bracket (19A). Remove saddle gib.

If table had been removed put a rope sling around right rear and left front corners, suspend from a crane and slide saddle off knee.

To Remove Knee Drive Motor and Mounting Bracket (See pages 65 & 122)

1. Break electrical connections to motor. Drain oil from knee.
2. Remove four screws that fasten the motor to its mounting bracket and work motor straight out. (On some makes of motors it will be necessary to remove the motor housings to gain access to the screws that fasten motor to mounting bracket).
3. Remove 7 screws and pry mounting bracket away from knee. (On vertical machines with power feed in vertical head it is necessary to

first remove the upper power feed bracket as per instructions on page 13. [On some vertical machines it is possible to lower the knee by power to its lowest position, then further lower it by hand one more turn to allow removal of the drive motor mounting bracket. To remove bracket in this manner first unscrew cap (2A, page 137) and raise telescopic tubes up against the power feed bracket (58, page 134) and prop or wire them there. Remove the screws holding the mounting bracket and pry bracket from knee. By pulling bracket away from knee at its bottom edge and at the same time lowering it the splined connection between vertical spline shaft (1A, page 132) and bevel gear (147A, page 136) can be broken.]

To Remove Knee with Table (For replacement of rapid traverse clutch)

1. Proceed as per instructions on this page, under "To Remove Knee Drive Motor and Mounting Bracket." Position knee about 2/3 up on column.

Center table, place a rope sling around ends, attach to a crane and remove slack. Loosen knee clamp at the left rear of knee. Remove center screw and tap lever (21A) to break off serrations of clamping screw. Unscrew gib screw and pull gib (40A) from left side of knee. Unscrew clamping screw (30A), four cap screws and lift knee guide (19A) out of its keyways on left side of knee. (See page 48.)

2. Remove two set screws (569A) through telescopic ring (572A) over base of elevating pedestal (566A). (See page 70.) Unscrew top outer telescopic tube (575A) from bottom of knee. (Tube has 27 threads per inch.) Tap second telescopic tube smartly upward against lip of outer tube to raise ring off base of pedestal base. Carefully screw outer tube back into bottom of knee, collapse tubes and block up under knee.

Remove two cap screws (571A) through base of pedestal and cap it to break seal between column and pedestal. Raise assembly until taper pins (568A) through pedestal base are clear. Rotate rear of knee to right and swing away from column.

To Remove Rapid Traverse Clutch and Gears (See page 42)

1. Proceed as per instructions on page 28, under "To Remove Knee with Table"
2. Thru opening in knee, left by removal of Motor Drive Mounting Bracket, loosen set screw, tap to loosen shoe underneath and remove Locknut (379A) from threaded portion of Rapid Traverse Clutch Shaft (372A)
3. Remove 4 screws (355A) and Cap (354A) from rear of knee. Remove 4 screws (349A). Screw a 3/8"-16 threaded rod, mounted with a slideable weight and having a nut on its outer end, into holes in outer face of Bearing Retainer Bushing (348A). Tap bushing from rear of knee with shaft (372A) and Rapid Traverse Clutch Assembly in place. Bevel Gear (340A) can be lifted thru opening in right side of knee.
4. Loosen set screw, tap to loosen lock shoe under screw and remove lock nut (352A) from the end of Rapid Traverse Clutch shaft (372A). Remove

bearing retainer bushing (348A), roller bearings, Rapid Traverse Clutch Gear (345A) and the clutch assembly from shaft (372A).

To Remove Knee (for partial or complete dismantling)

1. Drain oil from knee. Proceed as per instructions on page 18, under "To Remove Saddle"; as per instructions on page 28, under "To Remove Knee Drive Motor and Mounting Bracket".
2. Remove cap screws and cap circular plate (8A) at top rear of knee to remove it. (See page 48.) Unscrew outer and inner telescopic tubes from under knee. (Items 525A, 527A, page 70.) Run knee down until it is 1/3 up from bottom position.
3. Place a rope sling around knee so one loop is under rear and the other loop is under front of knee. The loop should cross and be attached to a crane hook at the top center of knee about an inch forward of edge of opening for elevating screw. (This point is over center of gravity of knee.)

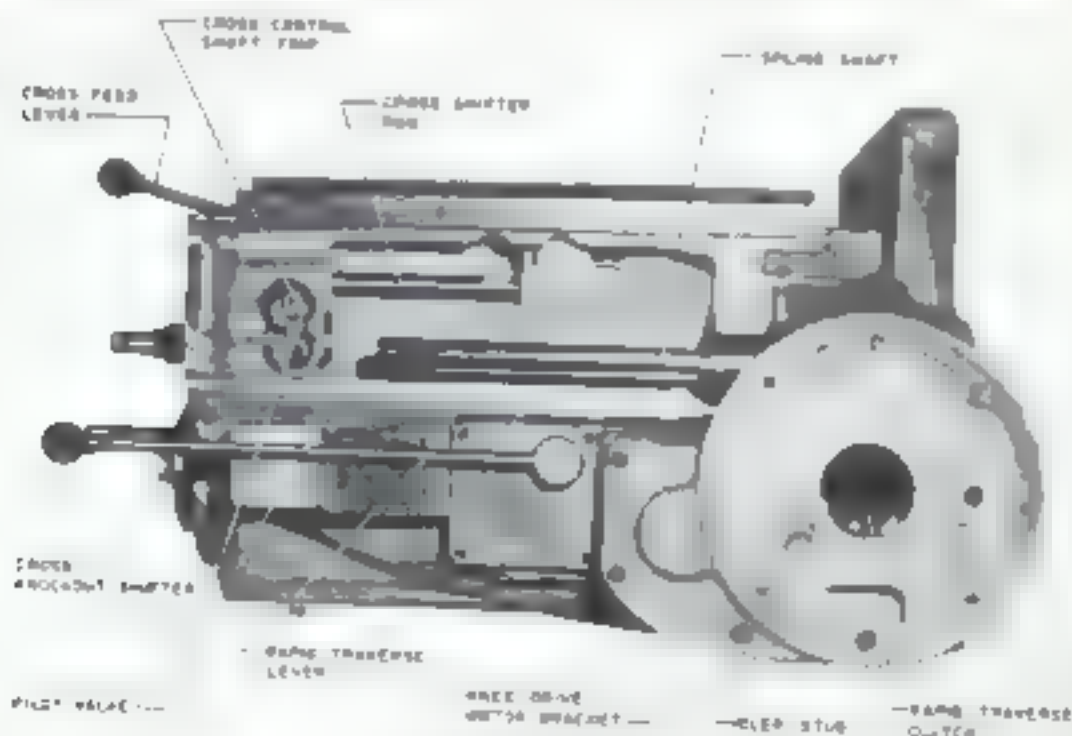



FIGURE 29
Right Side Of Knee

4. Loosen locking cap screw and remove capstan type nut (577A) from top of elevating screw (583A) page 70. Loosen knee clamp (31A) at left rear of knee; remove center screw and tap lever off serrations of clamping screw (30A). (See page 48.) Unscrew gib screw and pull gib (40A) from left side of knee. Unscrew clamping screw, four cap screws and lift knee guide (38A) out of its keyways on left side of knee.

Raise knee  free key in elevating screw from elevating bevel gear (583A). (See page 70.) Run elevating screw down into nut (584A) by hand, raise knee to clear pedestal, rotate to right and out of knee.

To Remove Safety Clutch and Shaft

(See page 60)

1. Proceed as per instructions, page 26, under "To Remove Knee For Dismantling" and place knee upside down on a bench.
2. Remove cap screws and taper pins from flange, fasten an eyebolt into drain plug hole and lift feed drive bracket out of knee with a crane. It is easier to remove and replace this bracket into knee while knee is upside down.
3. Proceed as per instructions on page 27, under "To Remove Feed Dial Assembly." Remove rectangular plate from rear bottom of knee.
4. Remove drive plug (34A) from front of knee. (See page 48.) Loosen set screw, tap to loosen lock shoe under screw and remove lock nut (299A, page 60). Pull safety clutch assembly (296A) from front end of safety clutch shaft (308A). Remove 4 screws and plug (330A) from rear face of knee. Loosen set screw, tap to loosen shoe under screw and remove lock nut (339A).
5. Remove cotter pin (338A) from the end of feed clutch piston (337A) and unscrew slotted nut (332A). Remove 4 screws (339A) holding feed clutch cylinder assembly (338A) and pull cylinder assembly from rear of knee. Lift feed clutch fork (333A) out of knee.
6. On 2M1 and 2M2 machines drive safety clutch shaft (308A) forward out of over riding clutch (324A) and knee. (See page 60.) On 3 M1 machines drive safety clutch shaft forward out of

over riding clutch (324A), pick out clutch, and then drive shaft toward back and out of knee.


To Remove Vertical and Cross Feed Control Shafts (See pages 54, 58)

1. Proceed as per instructions on page 29, under "To Remove Knee for Dismantling." Remove two set screws, through top of knee, that lock vertical detent shaft bushing (340A) on right side of knee. (See page 58.) Place knee upside down on a table.

Remove cap screws and taper pins from flange, fasten an eyebolt into drain plug hole, tap flange to break seal and lift feed drive bracket out of knee with a crane. Remove rectangular plate from rear bottom of knee and rear control bracket or pump bracket from left rear of knee.

2. Proceed as per paragraph 2, page 26, under "To Remove Front Elevating Shaft From Knee."
3. Tap vertical detent shaft (342A) from right to left out of knee, viewing knee from rear in upside down position. (See page 58.)

Remove two cap screws (252A) and pull power vertical feed trip hand lever (261A) assembly with shaft (260A) from left front of knee. Remove set screw from back of knee and pull power vertical feed trip dog lever (273A) and shaft (238A) from left rear of knee. Drill and tap (1/4-20) sealing plugs (246A, 247A) at ends of vertical feed rod (251A) and remove plugs. Loosen nut on wedge bolt through power elevating clutch fork (249A), tap nut to loosen bolt on shaft, tap vertical feed rod (251A) back until wedge bolt is in line with groove in shaft then lift out wedge bolt. Tap shaft (251A) out of rear of knee and remove fork.

Remove lock washer (417A) and capstan type nut (412A) from rear of knee. (See page 54.) Pull horizontal bevel gear assembly (401A) out rear of knee. End of bevel gear shaft (401A) is tapped 3/8 -  to aid removal.

When assembling, set fork (249A, page 58) on vertical feed rod (251A) so clutch (407A, page 64) is centrally located between gears (405A, 413A) with elevating lever in a neutral position.

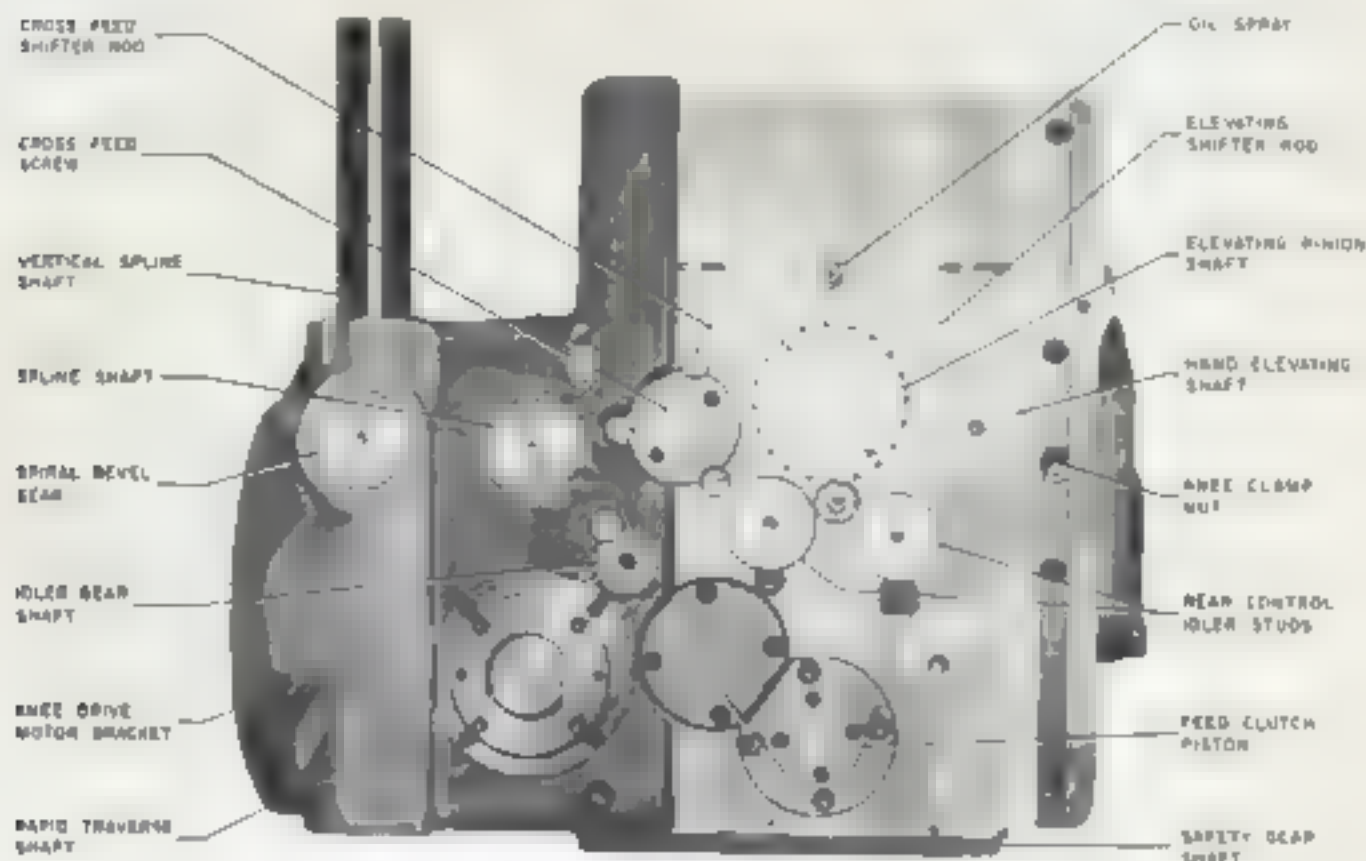


FIGURE 30
Rear View of Knee

4. Tap out taper pin and remove trip lever (160A) from cross feed detent shaft (156A). (See page 54.) Remove cotter pin from detent (159A) and drive shaft from dog end out of knee.

5. Remove collar (145A) and slip hand elevating gear (143A) from rear of knee. (See page 52.)

Drill and tap sealing plug (178A)—1 4"–20— and pull plug from front of knee. (See page 54.) Loosen nut on wedge bolt through fork (183A) that engages power cross feed clutch and tap nut to free bolt. Tap cross feed shaft (174A) from rear out front of machine.

6. If necessary, vertical bevel gear (583A) and telescopic tube sleeve (584A) could now be removed. (See page 70.) Remove set screw from left side of knee that locks telescopic tube sleeve, turn knee right side up and drive vertical bevel gear and tube sleeve down out of knee.

To Remove Cross Screw Clutch and Gears

1. Proceed as per instructions on page 30, under "To Remove Vertical and Cross Feed Control Shafts."
2. Remove three cap screws and pull rear bushing (108A) from back of knee. (See page 50.) With a hook pull out rear needle bearing (107A). Tap rear washer (105A) back on cross screw sleeve (102A) far enough to clear notches of washer from end of sleeve splines. Rotate washer 90° so align grooves with splines and start washer onto splines. Tap sleeve out back of knee and remove clutch (104A) and gears (100A, 108A). (It may be necessary to remove taper pin (88A) and move front bushing (97A) forward by tapping on clutch cross feed shaft gear (100A) to gain sufficient clearance to back off and rotate rear washer.)

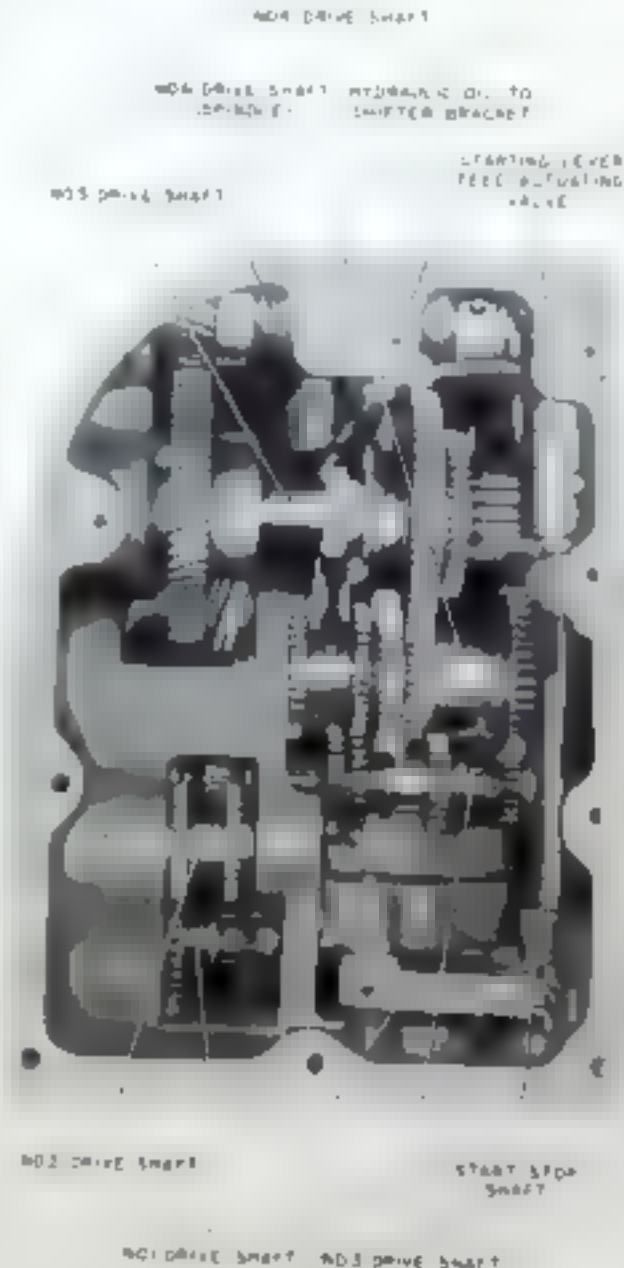
To Remove 5th Drive Shaft (Horizontal Machines) (See Figure 32)

1. Proceed as per paragraphs 1 through 3, page 23, under "To Remove Shifter Bracket"; as per paragraphs 1 through 4, page 24, under "To Remove Main Drive Bracket".
2. Remove seating plug (113A)—tapped 1/2"—11 as aid for removal. (See page 114.) Loosen locking screw and unscrew bearing adjusting nut (112A). Tap back gear (105A) back on shaft (approximately 1/16" to 1/8") until notches on bushing (100A) are clear of lugs on shaft (108A). With a screw driver, turn bushing until grooves are in line with lugs and slide gear assembly (105A) forward on shaft. Pull shaft (tapped 3/8"—16 as aid for removal) back out of column far enough to free rear bearing cup (111A) and front cone (106A). [Support gears and shaft as it is moved back.] Drop forward end of shaft and remove, with gears in place, through shifter bracket opening.

When assembling, tap rear cone (110A) onto shaft just far enough so spacer (109A) cannot slip onto bearing diameter of shaft. (This allows free movement of gear (105A) and its bearing assembly so bushing (100A) can be turned to engage notches with lugs.) With gears forward, enter rear end of shaft into bearing bore, slip forward and into front bearing cone (106A). Drive shaft forward and shaft horizontal so rear cone does not shift and allow spacer (109A) to drop onto small diameter. Also make certain that bushing (100A) does not move forward in bearing.) Slide gear assembly (105A) back on shaft so grooves clear lugs, turn bushing (100A) and slip gear assembly forward to engage notches with lugs. Hold gear (105A) forward with shaft horizontal and drive rear cone onto shaft. Slip rear bearing cup into place so top is cocked out and drive into place by tapping the bottom first. (The tilted entrance allows front edge of bearing to clear shoulder in straight bore in column.) Install bearing adjusting nut and lock,

paragraphs 1 through 4, page 24, under "To Remove Drive Bracket", as per paragraph 2, above, under "To Remove 5th Drive Shaft".

2. Remove dust cap (77A on page 112) from front of column. Remove copper tubing connected to spindle start valve (page 128).



CLUTCH SHIFTER LEVER

FIGURE 32

Left Side of Column Through
Shifter Bracket Opening

To Remove 6th Drive Shaft (Spindle on Horizontal Machine)

1. Proceed as per paragraphs 1 through 3, page 23, under "To Remove Shifter Bracket" as per

3. Pull spindle bearing cap (87A on page 112) from rear end of spindle. Loosen set screws in shoe type lock nuts (81A), (83A), (90A) and tap to free lock shoes under screws. Remove lock nut (80A) and unscrew lock nuts (81A) and (83A). Tap spindle forward and remove from column.

To Remove 5th Drive Shaft (Vertical Machines)

1. Proceed as per paragraphs 1 through 3, page 23, under "To Remove Shifter Bracket"; as per paragraphs 1 through 3, page 24, under "To Remove Main Drive Bracket."
2. Remove sealing plug at rear of 5th drive shaft. (Plug is tapped 1/2"-13 as aid for removal). Loosen locking screw and unscrew bearing adjusting nut. Break tubing connections at sleeve (238A) on page 120 at upper forward corner of shifter bracket opening in column. Pull shaft (164A) on page 116 (tapped 3/8"-16 as aid for removal) out of column far enough to clear forward bearing while supporting shaft and gears. Drop forward end of shaft and remove.

When assembling do not make tubing connections until 5th drive shaft is installed. Make certain sliding gear on 5th shaft does not contact copper tubing when shifted forward.

To Remove and Dismantle Power Feed to Vertical Head (See pages 132-136)

1. Lower knee to bottom position by power and then turn hand crank, one more turn to further lower knee. Drain oil from power feed bracket. Turn upper telescopic tube (141A) to unscrew it from power feed bracket (68A, page 134) and lower telescopic tube assembly onto motor drive bracket (8A, page 132).
2. Remove one screw (117A) from retainer (116A) and replace with an eyebolt. Place a rope or cable sling behind handwheel (69A) around dial (85A) and fasten to a crane. Attach a rope from the eyebolt to the crane and take slack out of rope.
3. Remove 5 cap screws (68A-1) and taper pin (68A) holding power feed bracket (68A) to right side of column. Pull power feed bracket away from column and elevate with crane to remove.

4. Move power feed bracket on a work bench or table. Remove center screw (81A) and pull handwheel with outer clutch (82A) in place from the end of shaft (113A). Through hole in dial (85A) remove threaded pin (73A). Remove plug (77A), set screw (75A) and remove collar (83A), inner clutch (84A) and dial (85A).

3. Remove screw (141A) from plug (142A). Screw a 1/8" - 16 threaded rod mounted with a sliding weight and having a nut on its outer end into plug (142A) and tap it from bracket. Remove bushing (143A) and piston (144A).
4. Remove 4 screws holding oil sight cover (79A) and remove cover. Remove retainer (116A) from end of bracket. Through oil sight cover opening build lock collar (95A), turn feed drive shaft (113A) until splines are in line with grooves in lock collar and drive shaft toward rear of bracket far enough to remove snap ring (102A) and pin (94A) from sleeve rack (101A). Loosen set screw, tap to loosen lock shoe and remove lock nut (100A) from threaded portion of shaft (113A). Shaft can now be removed from rear of bracket.

To Remove and Dismantle Vertical Head

1. Break unlock top of machine and remove coolant piping from head. Remove top cover plate (250A on page 122). Remove turret stop from right side of head. Remove power feed operating dog from slot on right side of head. Remove arbor draw-in bolt. Release vertical head clamping lever.
2. Raise or lower vertical head until 5/8"-11 tapped hole of steel sleeve in each side of counterweight is in line with hole in column. Screw two-threaded bars into counterweight to lock it in place. Elevate head slightly and free chain from counterweight. Lay chains down over front of head.

Remove snap rings, chain sprockets (268A, 271A) and washers from studs (276A, 279A) at each side of head. (See page 122.) Loosen locking set screws through top of head and pull out studs. Studs are tapped 3/8"-16 to aid removal. Screw a 1/2" eyebolt with a shank 5" long into tapped holes at each side of top of head between ways.

Fasten eyebolts in vertical head to a crane and maintain a slight tension on cables while elevating vertical head by hand until it is free of elevating screw. Remove girth from each side of head, raise head off column and set on its side on a bench. Take chains off head.

3. Remove rear cover (77A, page 144), oil retainer (94A, page 145) and top cover (79A) from rear of vertical head. Remove two 1/4 pipe plugs (57A, page 144) and oil cup from top rear of vertical head. Through top hole loosen set screw in upper lock nut (80A). Tap hexagon key to loosen locking shoe and unscrew upper nut. Through lower pipe plug hole, loosen set screw, and lock shoe in lower bearing nut (83A) (See page 146).

Insert a rod into capstan holes of nut and unscrew. Spline shaft (83A), clutch gear (86A) and sliding gear clutch (89A) can now be slipped out of head. Tap upper bearing cup (82A) from spline shaft bore before assembling. (Page 146)

Remove locking set screw at lower end of shaft (53A), remove shaft and brass sliding gear shifter fork (35A, page 144). Remove cotter key at inside end of back gear lever shaft (6A), left side of head, and remove lever and shifter arm (7A). (See page 142.) These parts do not have to be removed unless spindle is to be removed and all should be in place before spline shaft is replaced.

4. Remove bottom (120A, page 146) and top (97A) dust caps from spindle. Top dust cap is held in place by a snap ring and bottom cap by screws.

Remove cap screws from bearing retainer (89A), at top of head. Fasten a steel bar across retainer with two 1/4"-20 cap screws on a 4-5/8" diameter circle. With a bar through spindle, tap retainer and roller bearing cup up out of head. Loosen lock screw, tap to relieve locking shoe, and remove top lock nut (100A) from spindle. Through rear opening tap high speed gear (104A) up off keyway and remove from spindle. Similarly, tap low speed gear (105A) to loosen it from taper on spindle.

Through pipe plug hole on left side of head, loosen set screw in bearing adjusting nut (106A), tap to relieve locking shoe and unscrew nut. Rotate spindle so bearing key (116A) faces rear. Fasten a steel bar across spindle nose with two 1/4"-20 cap screws in bottom dust cap screw holes on a 8-5/16" diameter circle. (This is a safety measure to prevent spindle from falling in case it has become loose in upper bearing.) Lift bearing key out of bearing, remove bar from spindle nose and tap spindle out of head.

When assembling, use same bar across spindle nose to hold spindle in place while upper tapered roller bearing cone, bearing key and adjusting nut are being installed. Remove stationary bar and use a 1" square bar in key slots to pull up adjusting nut.

To Remove Spiral Bevel Gear and Pinion (Vertical Machine)

1. Proceed as per paragraphs 1 through 3, page 23, under "To Remove Shifter Bracket"; as per paragraphs 1 through 3, page 24, under "To Remove Main Drive Bracket"; as per paragraphs 1 through 3, page 33, under "To Remove Vertical Head".
2. Loosen set screw, tap to loosen lock shoe underneath, remove nut (145A) and driven gear (144A) at end of spiral bevel stem pinion. (See page 116.) Loosen adjusting nut (143A) at end of stem pinion. (Gears can be locked together with a copper strip in teeth while loosening these nuts.) Remove cap screws and lift out bearing retainer (129A) with spiral bevel gear (133A) assembly. Remove adjusting nut and tap stem pinion (137A) forward out of its bearings. (A sealing plug will be driven out of casting with pinion.)

Fitting washers (130A and 138A) under gear and pinion were ground to allow .003" to .004" backlash between gears. If gears are replaced with new ones, install original spacers and check backlash. (These gears are lapped together and always supplied as a pair.)

MAINTENANCE HINTS

1. Be certain that all stations are kept properly lubricated in accordance with lubricating instructions.
2. Keep your machine as clean as possible it pays. Use a stiff bristled brush to remove chips rather than compressed air. An air blast may drive dirt into bearings to cause undue wear. Also, flying chips can be dangerous to fellow workers.
3. Safety stop dogs are provided to disengage power drive to all sliding units. Do not remove these dogs in an effort to obtain more travel, as serious damage to the machine may result if a unit is being power driven when it strikes another unit.
4. The electrical compartment door should never be opened except by an experienced maintenance man for electrical control repair work.
5. Manual handwheels and cranks are provided with springs and positive knockouts to disengage dog clutches during power feed. Do not tamper with these disengaging mechanisms in order to keep a handwheel in engagement, as it may result in serious injury to operator or fellow worker.
6. Do not try to reverse the direction of spindle rotation while it is in motion.
7. The feed change lever on front of knee should not be moved unless all feed levers are in their neutral positions.
8. Check oil supply in arbor support before using. When storing away, invert arbor support and place on a non-metallic surface. If stored away while in an upright position the oil in reservoir continues to drain out.

Below in capital letters are listed problems that may be encountered. Under each are listed—in italics—probable causes and, below, the corrections.

LOW HYDRAULIC OIL PRESSURE

-a-

Oil level in column too low.

Fill and maintain level at bottom of opening

-b-

Incorrect relief valve setting in column.

Set oil pressure per instructions on page 21.

-c-

Clogged section line strainer.

Drain column through 1" pipe nipple at right rear of machine under motor cover. Unscrew strainer from right rear of machine, above drain. Clean strainer and scrape out bottom of sloping reservoir before replacing strainer.

-d-

Worn pump gears or broken housing.

Remove pump per instructions in paragraph 2, page 24 and renew necessary parts.

SPEED GEARS FAIL TO SHIFT

-a-

Low hydraulic oil pressure.

Set oil pressure per instructions on page 21.

-b-

Dirt in oil, or a poor grade of oil, that is breaking down, has lodged around relief valve and caused it to stick open.

Remove 1 1/2" pipe from top center of shifter bracket. Hold a rag loosely over hole and momentarily start machine. The spurt of oil from hole may carry dirt out with it.

Check hydraulic oil pressure per instructions on page 21. If necessary, take off shifter bracket per instructions on page 23, remove relief valve and clean.

Flush column and lines, clean strainer, then keep column reservoir filled only with oil of correct specifications per page 15. Check and set pressure at 200-210 psi.

While shifter bracket is off machine check to see that shifter forks and operating pistons move reasonably free.

SPEED VARIATION FROM ACTUAL DIAL READING

-a-

Dial loose on drum.

Start machine and run spindle at lowest rpm

(lowest and highest speeds are adjacent on dial). Loosen spanner type lock nut and turn dial until it indicates actual spindle speed. Tighten nut.

-b-

Low hydraulic oil pressure.

Reset oil pressure per instructions on page 11.

If oil pressure fails to remain high enough or relief adjusting screw requires more than a slight adjustment, follow instructions under "b" of "Speed Gears Fail to Shift".

TABLE FEED DOES NOT AGREE WITH DIAL SETTING

Dial loose on sleeve.

Start machine and set table at lowest feed rate. (Lowest and highest feed rates are adjacent on dial.) Loosen spanner type lock nut and turn dial until it indicates lowest feed rate. Tighten nut.

FAULTY OPERATION OF MAIN CLUTCH AND SPINDLE BRAKE

-a-

Improper adjustment of drive clutch.

Adjust clutch per instructions on page 18.

-b-

Worn brake plates allow spindle to coast after main clutch is disengaged.

Remove Drive Bracket per instructions on page 24 and remove No. 1 Drive Shaft. Lift off clip ring and slide off spacer and brake plates. With new brake plates in place, the spacer should be ground on a surface grinder so there is .020" clearance between shoulder of hub and inner brake plate.

RAPID TRAVERSE LEVERS DO NOT RETURN TO NEUTRAL POSITION WHEN RELEASED

Disengaging tension spring broken.

Proceed per instructions on page 25, under "To Remove Feed Drive Bracket." Replace spring (218A), page 56.

RAPID TRAVERSE TABLE MOVEMENTS ERRATIC

Table gibs setting too tight.

Reset gibs per instructions on page 18.

POWER CROSS OR VERTICAL FEED LEVERS HANG UP BEFORE CLUTCH IS ENGAGED WITH RESULTANT CLASHING OF GEARS

Worn detents on control shifting.

Proceed per instructions on page 30, under "To Remove Vertical and Cross Feed Detent Shafts." Insert new detents.

KNEE MOVEMENT DOES NOT COINCIDE WITH DIAL MOVEMENT

Gib setting too tight.

Reset knee gibs per instructions on page 18.

KNEE DROPS FROM DIAL SETTING AFTER IT HAS BEEN MOVED UP OR DOWN

Worn brake shoes on elevating shaft.

Proceed per instructions on page 25, and remove feed/drive bracket from bottom of knee. Remove rear control bracket or rectangular cover from left rear of knee. Unscrew 1/2" set screw, over rear of vertical feed lever, from left side of knee.

Through bottom and side opening, extract roller key and remove vertical pin from brake on front elevating shaft. Slide brake back along shaft, extract horizontal pin from rear of brake and lift shoes off hub.

When assembling new brake shoes, make certain that set screw engaging slot is down.

KEY NUMBER LOCATION INDEX

Unit Name	Drawing Name	Key Numbers	Page Number	Key Numbers of Drawings of Other units
Shifter Bracket 2JS	Selector Valve	1A - 35A	41	
	Shifter Forks	56A - 111A	43	
	Hydraulic Tubing	112A - 132A	45	
Feed Box - 2JF	Feed Box	1A - 71A	47	
Knee - 2JX	Knee and Covers	1A - 69A	49	
	Cross Feed Screw	70A - 110A		
		870A - 877A		
	Elevating Shaft	111A - 149A	53	
	Cross Feed Control	150A - 194A	55	
	Rapid Traverse Control	195A - 229A	57	
	Vertical Feed Control	230A - 287A		
	Feed Dial	288A - 291A	59	
	Safety Gear Shaft	292A - 342A	61	
	Rapid Traverse Clutch	342A - 385A	63	
	Spline Shaft	386A - 400A		
	Elevating Pinion	401A - 418A	65	
	Idler Gears	419A - 440A		
	Motor Drive	441A - 504A		
	Rear Control Bracket	505A - 562A	69	
	Elevating Screw	578A - 584A	71	27C-563A thru 577A, 2JC-585A thru 587A
	Hydraulic Pump	588A - 623A		
	Strainer Filter	624A - 628A	73	
	Hydraulic Tubing	629A - 645A		
	Lubrication Tubing	646A - 667A	75	
Saddle Table 2JH	Bracket Under Saddle	1A - 47A	77	
	Saddle and Linkage	48A - 131A	79	
	Leadscrew Clutch	132A - 182A	81	
	Universal Saddle	183A - 214A	83	
	Universal Housing	215A - 270A	85	
	Control Linkage	271A - 319A	87	
	Short Lead Attachment	320A - 339A		
	Backlash Eliminator	340A - 360A	89	
	Table, Leadscrew, and Backlash Nuts	361A - 388A	91	
	Table Apron	389A - 431A	93	
	Table Dogs, Without Automatic Table Cycle	432A - 443A		
	Table Dogs, With Automatic Table Cycle	444A - 476A	95	
	Automatic Table Cycle Valve	477A - 504A		
	Saddle Table Lubrication	505A - 537A	97	
	Saddle Table Lubrication	538A - 568A	99	
	Saddle Table Lubrication	569A - 629A	101	
	Saddle Table Lubrication	630A - 672A	103	

KEY NUMBER LOCATION INDEX (Continued)

Unit Name	Drawing Name	Key Numbers	Page Number	Key Numbers of Drawings of Other Units
Motor Drive-2JN	Motor Drive	1A - 23A	105	
Drive Bracket 2JBM	Drive Bracket	1A - 64A	107	
	Clutch	65A - 127A	109	2JN-103A, 110A, 111A
Column - 2JC	Column and Covers	1A - 69A	111	
	Horizontal Spindle	70A - 94A	113	
	Back Gear Shaft	95A - 113A	115	
	Pump Drive Shaft	114A - 123A		
	Vertical Drive Shafts	124A - 159A	117	
	Overarm and Arbor Supports	159A - 206A	119	
	Control Levers	207A - 244A	121	
	Vertical Head Counterweight and Guides	245A - 298A	123	
	Feed Control Valve	299A - 320A	125	
	Spindle Stop Valve	331A - 364A	127	
	Column Tubing	365A - 392A	129	
	Column Tubing	393A - 427A	131	
Feed to Vertical Head - 2JAJ	Drive from Knee	1A - 48A	133	
	Upper Bracket	47A - 119A	135	
	Shifting Linkage Telescopic Tubes	119A - 161A	137	
	Hand Feed Bracket	162A - 202A	139	
Turret Stop 2JAR	Turret and Micrometer Stops	1A - 36A	141	2JAJ-203A thru 211A
Vertical Head 2JDV	Shifter Control and Oil Gages	1A - 36A	143	
	Vertical Head Feed Screw and Pump	37A - 77A	145	2JAJ-60A, 61A, 63A, 67A, 70A, 71A, 73A, 74A, 2JC-450A thru 465A
	Vertical Spindle and Back Shaft	76A - 121A	147	
Coolant - 2JP	Coolant Supply	1A - 29A	149	2JN-30A, 31A
	Coolant Supply	32A - 52A	151	2JN-53A, 54A
Instruction Plates		1A - 16A	153	

HOW TO ORDER REPAIR PARTS

You will receive quicker and better service when ordering repair parts if you will adhere to the following instructions when ordering such replacements.

These four requirements are essential:

1. State amount wanted.
2. Give catalog key number, part number and name of part. In ordering parts of part number, please advise where the number was obtained. (See paragraph A, below.)
3. Give complete serial number of machine. It is stamped on right front of table and top front of column - figures 4B and 8B.
4. Specify how and where to ship. (See paragraph B, below.)

PARAGRAPH A

When ordering parts by number, kindly advise how the number was obtained, namely:

Number stamped on part.

Prior Invoice.

Parts List Catalog. (Give identification and publication numbers on front cover.)

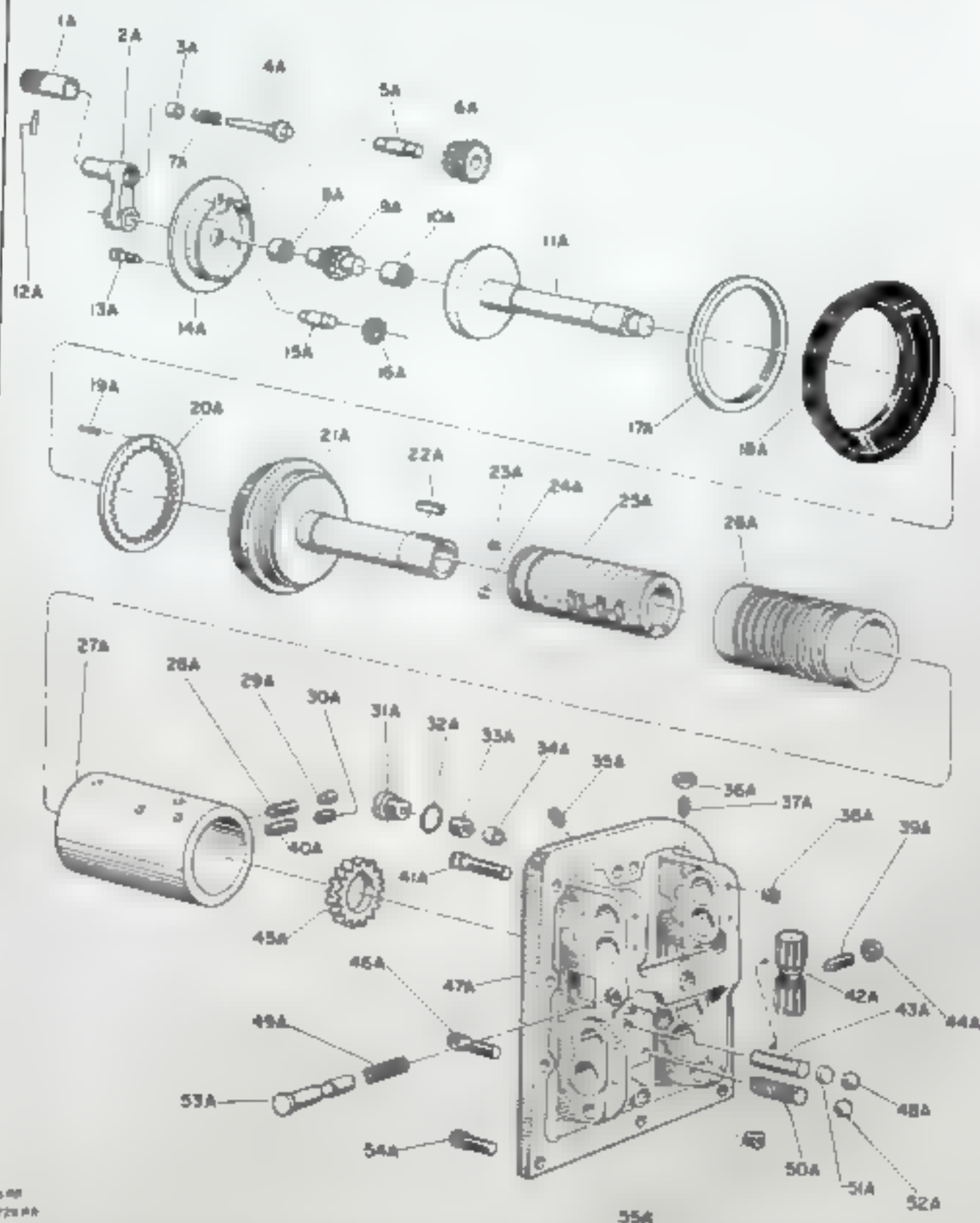
PARAGRAPH B

Do not say, "Ship quickest way." Be definite and state agency desired, that is - Air Mail, Parcel Post (Special Delivery), Parcel Post (Regular), Express, Motor Freight, Rail Freight, etc.

Specify each individual piece that is required in the order. If only certain parts of a unit are required, never use the word "complete"; it always raises a question as to how much of a unit to supply.

However, in some cases, due to the nature of the part, it will be necessary and less costly to you, for us to supply additional related pieces, especially if part wanted is obsolete.

SELECTOR VALVE



CINCINNATI NOS 2 ML, 2 M AND 3 M MILLING MACHINES

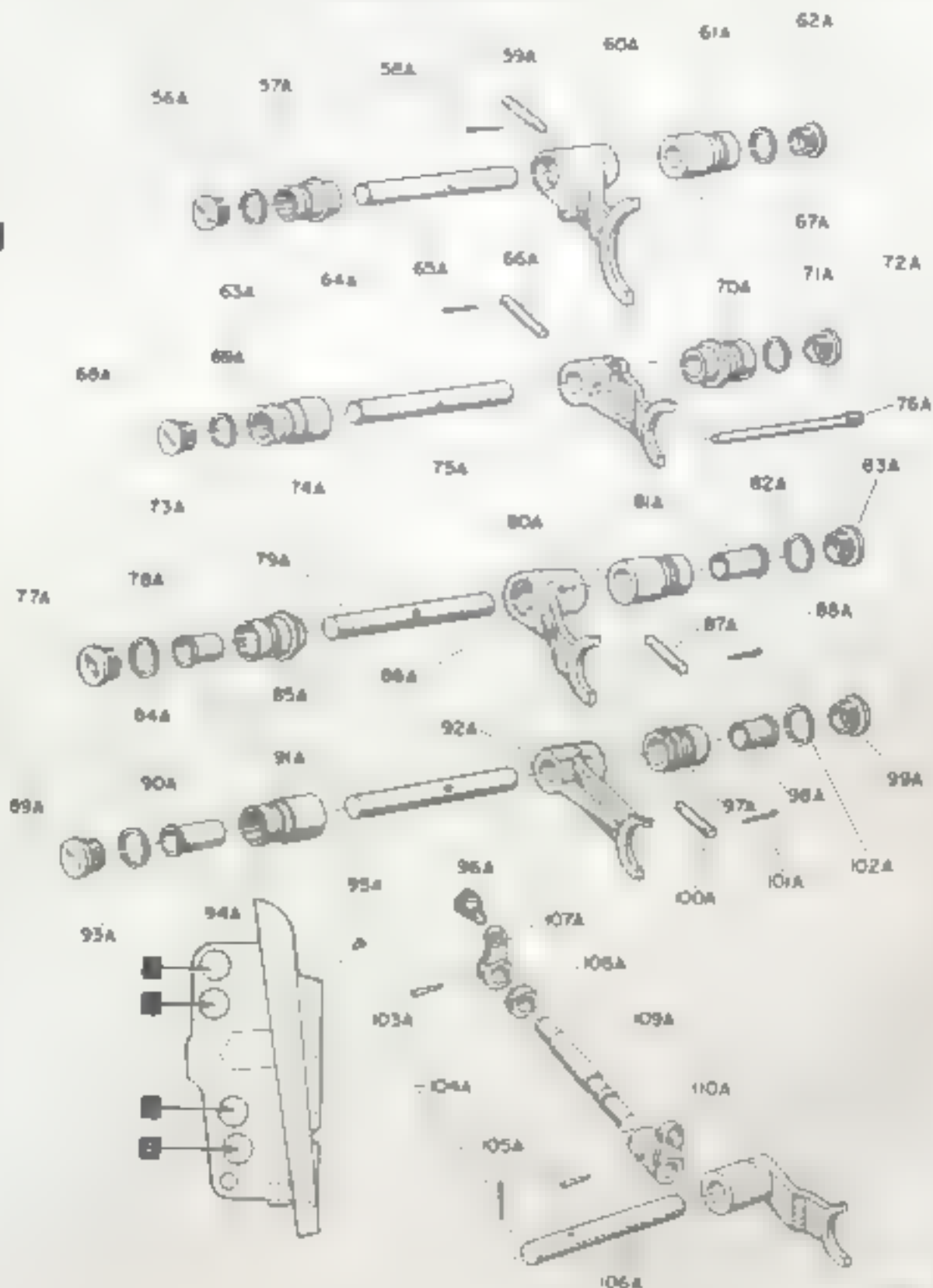
WHEN ORDERING PARTS, give key number, part number and part name. Be sure to give complete serial number for your machine. For complete instructions, see Page 99, "How to Order Repair Parts."

SHIFTER BRACKET — UNIT No. 2/3

2ML, 2M AND 3M PLAIN AND UNIVERSAL
2M VERTICAL

Key No	Part No	Part Name	Am't Used	Key No	Part No	Part Name	Am't Used
275-1A	112028	Handle - Speed Change	1	275-26A	124221	Bushing - Selector Valve	1
275-2A	111251	Lever - Index	1	275-27A	124224	Shaver - Selector Valve - Outer	1
275-3A	108802	Bushing	1	275-28A	2220	Screw - Set	1
275-4A	110853	Plinger - Index	1	275-29A	2222	Screw - Set	1
275-5A	111247	Shaft - Index Gear	1	275-30A	2223	Screw - Set	1
275-6A	111918	Gear - Compound Mill	1	275-31A	2224	Screw - Set	1
275-7A	149	Spring	1	275-32A	2225	Screw - Pipe Thread	1
275-8A	79435	Bushing - Needle	1	275-33A	2226	Ring - "C"	1
275-9A	112481	Gear - Index Lever	1	275-34A	2227	Screw - Stalling Bar	1
275-10A	14267	Bushing - Needle	1	275-35A	2228	Packing - Stalling Bar	1
275-11A	112482	Shaft - Selector Valve Gears	1	275-36A	2229	Screw - Set	1
275-12A	2201	Pin - Taper	1	275-37A	2230	Pin - Wire	1
275-13A	2102	Screw	1	275-38A	2231	Screw - Set	1
275-14A	112046	Plate - Index	1	275-39A	2232	Pin - Pipe	1
275-15A	112483	Shaft - Mill Gear	1	275-40A	2233	Screw - Set	1
275-16A	112484	Gear - Mill	1	275-41A	2234	Screw - Set	1
275-17A	111248	Key - Speed Dial	1	275-42A	2235	Screw	1
275-18A	111249	Dial - Speed	1	275-43A	2236	Frame - Indicator	1
	112047	Plain and Universal Machines	1	275-44A	2237	Part - Indicator	1
	112048	Plain and Universal Machines	1	275-45A	2238	Pin - Set	1
	112049	Plain and Universal Machines	1	275-46A	2239	Detent - Valve	1
	112050	Vertical Machines	1	275-47A	2240	Screw	1
	112051	Vertical Machines	1	275-48A	2241	Brackets - Gear Hub	1
	112052	Vertical Machines	1	275-49A	2242	Ball - Steel	1
275-19A	2203	Pin	1	275-50A	2243	Spring - Plunger	1
275-20A	111246	Gear - Internal	1	275-51A	2244	Part - Indicator	1
275-21A	279817	Shaver - Selector Valve	1	275-52A	2245	Washer - Spring	1
275-22A	1413	Key	1	275-53A	2246	Ball - Steel	1
275-23A	2220	Pin - Pipe	1	275-54A	2247	Plunger - Valve Detent	1
275-24A	1444	Pin	1	275-55A	2248	Screw	1
275-25A	124224	Shaver - Selector	1	275-56A	2249	Pin - Pipe	1

SHIFTER FORKS

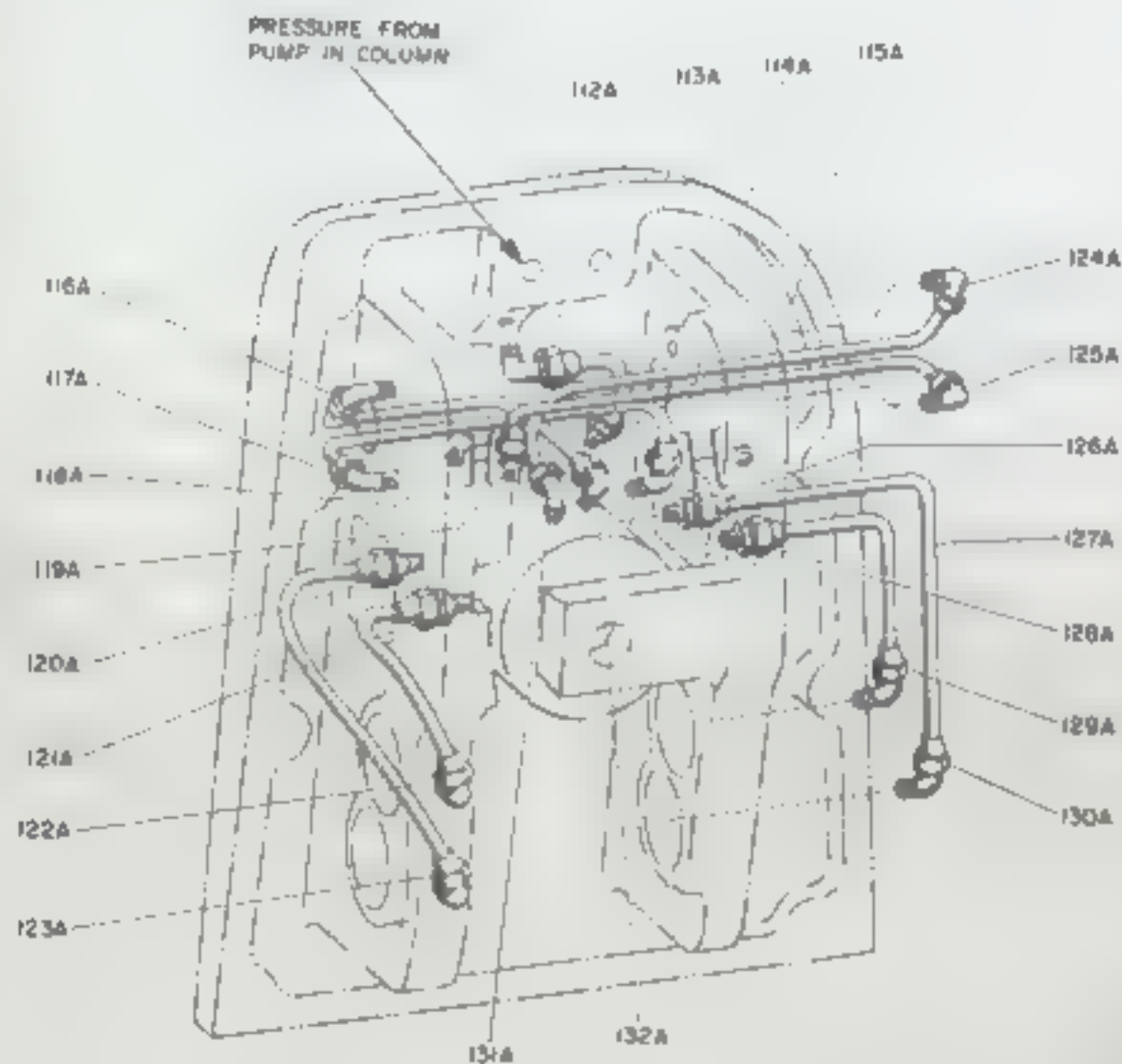


WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial numbers for your machine. For complete instructions, see Page 99 "How to Order Pepan Parts."

2M4, 2M6 AND 3M PLAIN AND UNIVERSAL
3M VERTICAL

Key No.	Part No.	Part Name	Ass. Card	Ass. No.	Part No.	Part Name	Ass. Card
228-26A	111271	Plug - Cylinder	L	228-26A	111271	Pin - Primary Gear Shaft	L
228-27A	111270	Cylinder - Secondary Gear Shaft	L	228-27A	111270	Cylinder - Primary Gear Shaft	L
228-28A	2093	Pin - Control	L	228-28A	111270	Pin - Primary Gear Shaft	L
228-29A	100400	Pin - Straddle	L	228-29A	100400	Gasket	L
228-30A	111272	Pin - Upper Secondary Gear	L	228-30A	111272	Plug - Cylinder	L
228-31A	111270	Cylinder - Secondary Gear Shaft	L	228-31A	100400	Gasket	L
228-32A	111271	Plug - Cylinder	L	228-32A	111271	Cylinder - Primary Gear Shaft	L
228-33A	111271	Gasket	L	228-33A	111271	Pin - Upper Primary Gear	L
228-34A	111271	Pin - Upper	L	228-34A	111271	Pin - Straddle	L
228-35A	2093	Pin - Control - Plate and Unsprung	L	228-35A	100400	Pin - Collar	L
		Ma. Worm On	L	228-35A	111271	Plug - Cylinder	L
228-36A	100400	Pin - Straddle - Plate and Unsprung	L	228-36A	111271	Pin - Primary Gear Shaft	L
		Ma. Worm On	L	228-36A	111271	Pin - Primary Gear Shaft	L
228-37A	111271	Gasket	L	228-37A	111271	Pin - Lower Primary Gear	L
228-38A	111271	Plug - Cylinder - Plate and Unsprung	L	228-38A	100400	Gasket	L
		Ma. Worm On	L	228-38A	111271	Cylinder - Primary Gear Shaft	L
228-39A	111270	Cylinder - Secondary Gear Shaft - Plate and Unsprung	L	228-39A	100400	Pin - Speed Dial	L
		Ma. Worm On	L	228-39A	111271	Pin - Reverse Lever	L
228-40A	111270	Cylinder - Secondary Gear Shaft - Plate and Unsprung	L	228-40A	111271	Cylinder - Primary Gear Shaft	L
228-41A	111271	Gasket - Plate and Unsprung	L	228-41A	111270	Pin - Primary Gear Shaft	L
		Ma. Worm On	L	228-41A	100400	Gasket	L
228-42A	111271	Plug - Cylinder - Plate and Unsprung	L	228-42A	111271	Pin - Straddle	L
		Ma. Worm On	L	228-42A	111271	Pin - Collar	L
228-43A	111271	Gasket - Plate and Unsprung	L	228-43A	111271	Plug - Cylinder	L
		Ma. Worm On	L	228-43A	111271	Pin - Taper	L
228-44A	111270	Pin - Lower - Plate and Unsprung	L	228-44A	111271	Pin - Collar	L
		Ma. Worm On	L	228-44A	111271	Pin - Type	L
228-45A	111271	Pin - Lower - Secondary Gear - Plate and Unsprung	L	228-45A	111271	Pin - Reverse Gear Shaft	L
		Ma. Worm On	L	228-45A	111271	Pin - Reverse	L
228-46A	111271	Pin - Upper - Secondary Gear - Plate and Unsprung	L	228-46A	111271	Pin - On	L
		Ma. Worm On	L	228-46A	111271	Pin - Reverse Lever	L
228-47A	111271	Pin - Upper - Secondary Gear - Plate and Unsprung	L	228-47A	111271	Pin - Reverse Gear Shaft	L
		Ma. Worm On	L	228-47A	111271	Pin - Reverse Gear	L

HYDRAULIC TUBING



CINCINNATI NOS 2 ML 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

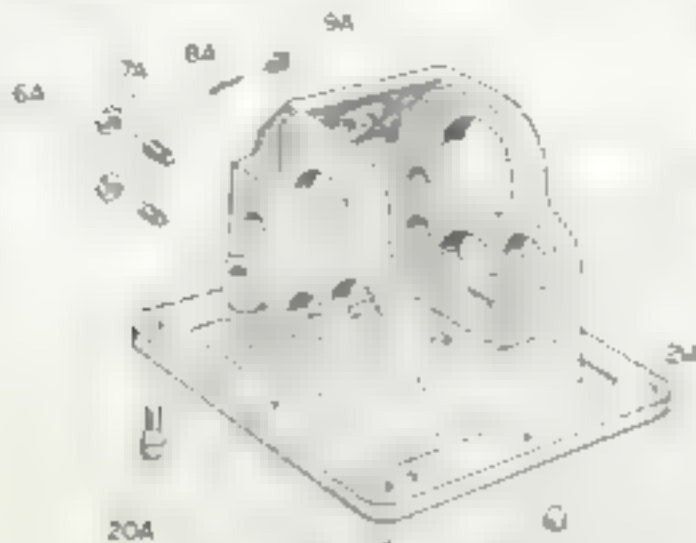
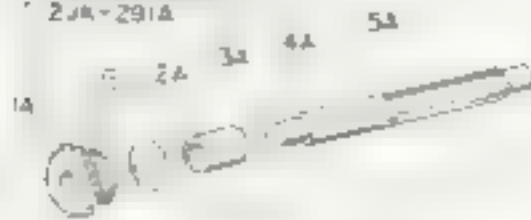
SHIFTER BRACKET — UNIT No. 2/5 (Concluded)

2MI, 2MI AND 3MI PLAIN AND UNIVERSAL
2MI VERTICAL

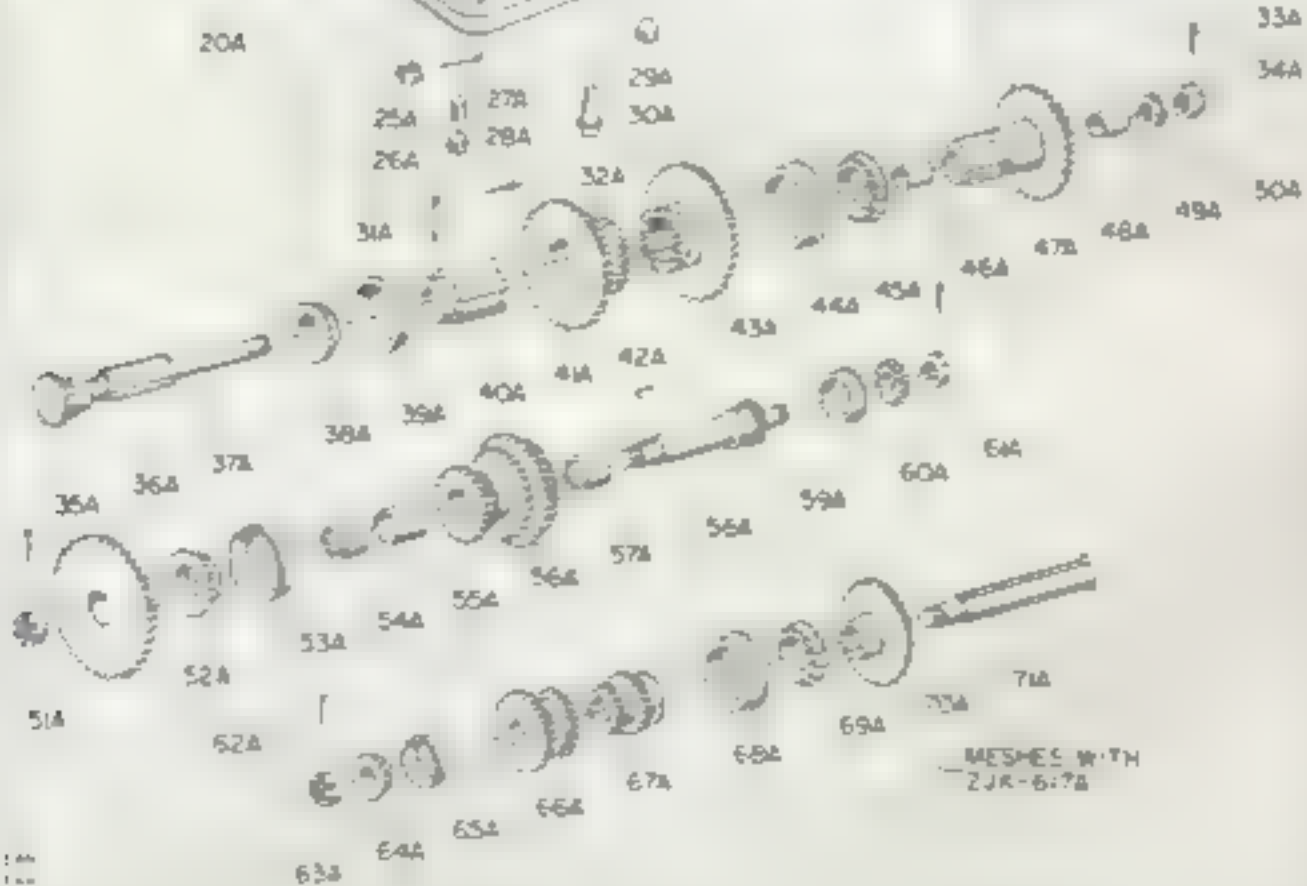
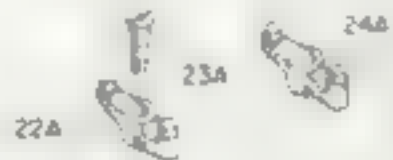
Key No.	Part No.	Part Name	Ampt. Lead	Key No.	Part No.	Part Name	Ampt. Lead
278-113A	4015	Fitting - Tubing - Elbow	1	278-125A	50153	Fitting - Tubing - Elbow	1
278-113A	70123	Fitting - Tubing	1	278-126A	50153	Fitting - Tubing - Elbow	1
278-114A	30153	Fitting - Tubing - Elbow (Plain and Universal Machines Only)	1	278-127A	50153	Fitting - Tubing - Elbow (Plain and Universal Machines Only)	1
278-115A	70124	Plug - Pipe (2MI Vertical Machine Only)	1	278-128A	50154	Fitting - Tubing	1
278-116A	50153	Fitting - Tubing - Elbow	1	278-129A	50154	Fitting - Tubing	1
278-117A	50153	Fitting - Tubing - Elbow (Plain and Universal Machines Only)	1	278-130A	50154	Fitting - Tubing - Elbow	1
278-118A	70124	Plug - Pipe (2MI Vertical Machine Only)	1	278-131A	50154	Fitting - Tubing - Elbow	1
278-119A	50154	Fitting - Tubing (Plain and Universal Machines Only)	1	278-132A	50154	Fitting - Tubing - Elbow	1
278-120A	50154	Fitting - Tubing	1				
278-121A	50154	Fitting - Tubing	1				
278-122A	50154	Fitting - Tubing	1				
278-123A	50154	Fitting - Tubing - Elbow	1				

FEED BOX

MESHES WITH
2JK-291A



MESHES WITH
2JK-296A



MESHES WITH
2JK-617A

COMPUTATIONAL LOGIC AND LOGIC PROGRAMS

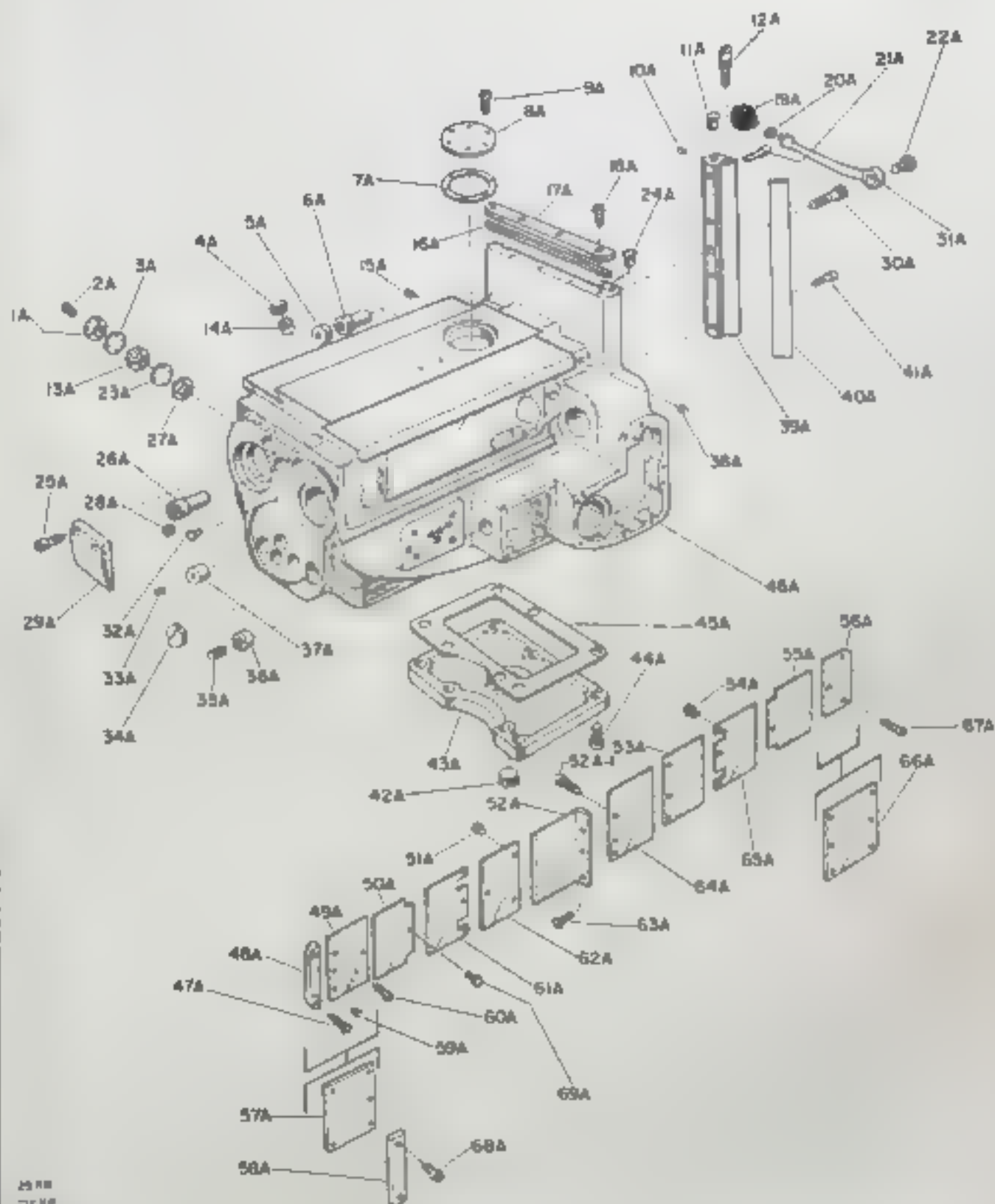
WHEN ORDERING PARTS, give us the number, part name and part number. Be sure to give complete details under the part number. For complete instructions, see Page 17, "How to Order Repair Parts."

FEED BOX — UNIT No. 21F

3AM, 3AM AND 3AM PLAIN AND UNIVERSAL
2AM VERTICAL

Ref No	QUM No	Ref No	QUM No	Ref No	QUM No	Ref No	QUM No
21P-1A	114188	21P-2A	114189	21P-3A	114190	21P-4A	114191
21P-5A	114192	21P-6A	114193	21P-7A	114194	21P-8A	114195
21P-9A	114196	21P-10A	114197	21P-11A	114198	21P-12A	114199
21P-13A	114200	21P-14A	114201	21P-15A	114202	21P-16A	114203
21P-17A	114204	21P-18A	114205	21P-19A	114206	21P-20A	114207
21P-21A	114208	21P-22A	114209	21P-23A	114210	21P-24A	114211
21P-25A	114212	21P-26A	114213	21P-27A	114214	21P-28A	114215
21P-29A	114216	21P-30A	114217	21P-31A	114218	21P-32A	114219
21P-33A	114220	21P-34A	114221	21P-35A	114222	21P-36A	114223
21P-37A	114224	21P-38A	114225	21P-39A	114226	21P-40A	114227
21P-41A	114228	21P-42A	114229	21P-43A	114230	21P-44A	114231
21P-45A	114232	21P-46A	114233	21P-47A	114234	21P-48A	114235
21P-49A	114236	21P-50A	114237	21P-51A	114238	21P-52A	114239
21P-53A	114240	21P-54A	114241	21P-55A	114242	21P-56A	114243
21P-57A	114244	21P-58A	114245	21P-59A	114246	21P-60A	114247
21P-61A	114248	21P-62A	114249	21P-63A	114250	21P-64A	114251
21P-65A	114252	21P-66A	114253	21P-67A	114254	21P-68A	114255
21P-69A	114256	21P-70A	114257	21P-71A	114258	21P-72A	114259
21P-73A	114260	21P-74A	114261	21P-75A	114262	21P-76A	114263
21P-77A	114264	21P-78A	114265	21P-79A	114266	21P-80A	114267
21P-81A	114268	21P-82A	114269	21P-83A	114270	21P-84A	114271
21P-85A	114272	21P-86A	114273	21P-87A	114274	21P-88A	114275
21P-89A	114276	21P-90A	114277	21P-91A	114278	21P-92A	114279
21P-93A	114280	21P-94A	114281	21P-95A	114282	21P-96A	114283
21P-97A	114284	21P-98A	114285	21P-99A	114286	21P-100A	114287

KNEE AND COVERS



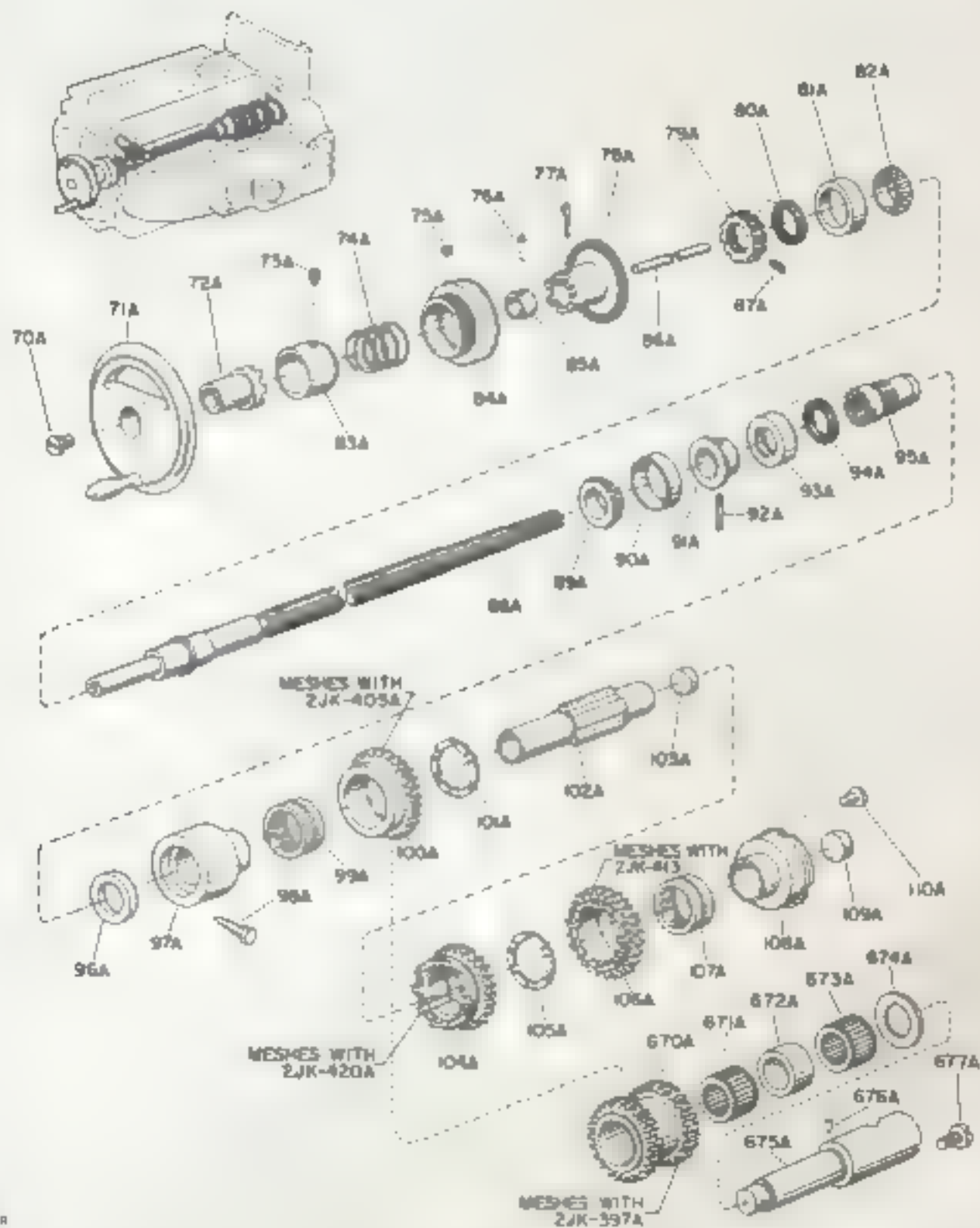
25 111
211 111
645 111

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 79, "How to Order Repair Parts."

200L, 200R AND 100R PLAIN AND UNIVERSAL
200 VERTICAL

Part No.	Part Name	Qty	Part No.	Part Name	Qty
27K-1A	Cover - Oil Gauge	1	27K-2A	Plug	1
27K-2A	Screw	1	27K-3A	Gasket - Cover	1
27K-4A	Disk - Oil Gauge	1	27K-4A	2X1, 2X1, Machine	1
27K-5A	Cap - Oil Gauge	1	27K-5A	2X1 Machine	1
27K-6A	Plug	1	27K-6A	Oil - Gasket	1
27K-7A	Nut - Clamp	1	27K-7A	2X1, 2X1, Machine	1
27K-8A	Cover - Connecting Screw Cover	1	27K-8A	2X1 Machine	1
27K-9A	2X1, 2X1, Machine	1	27K-9A	Screw (2X1, 2X1, Machine Only)	1
27K-10A	2X1 Machine	1	27K-10A	Plug - Plug	1
27K-11A	Cover - Connecting Screw	1	27K-11A	Cover - Cover	1
27K-12A	2X1, 2X1, Machine	1	27K-12A	2X1, 2X1, Machine	1
27K-13A	2X1 Machine	1	27K-13A	2X1 Machine	1
27K-14A	Screw	1	27K-14A	Screw	1
27K-15A	Plug	1	27K-15A	2X1, 2X1, Machine	1
27K-16A	Oil	1	27K-16A	2X1 Machine	1
27K-17A	2X1 - Oil	1	27K-17A	2X1 Machine	1
27K-18A	Cover - Oil Cover	1	27K-18A	2X1 Machine	1
27K-19A	2X1 - Oil	1	27K-19A	2X1 Machine	1
27K-20A	2X1 - Oil	1	27K-20A	2X1 Machine	1
27K-21A	2X1 - Oil	1	27K-21A	2X1 Machine	1
27K-22A	2X1 - Oil	1	27K-22A	2X1 Machine	1
27K-23A	2X1 - Oil	1	27K-23A	2X1 Machine	1
27K-24A	2X1 - Oil	1	27K-24A	2X1 Machine	1
27K-25A	2X1 - Oil	1	27K-25A	2X1 Machine	1
27K-26A	2X1 - Oil	1	27K-26A	2X1 Machine	1
27K-27A	2X1 - Oil	1	27K-27A	2X1 Machine	1
27K-28A	2X1 - Oil	1	27K-28A	2X1 Machine	1
27K-29A	2X1 - Oil	1	27K-29A	2X1 Machine	1
27K-30A	2X1 - Oil	1	27K-30A	2X1 Machine	1
27K-31A	2X1 - Oil	1	27K-31A	2X1 Machine	1
27K-32A	2X1 - Oil	1	27K-32A	2X1 Machine	1
27K-33A	2X1 - Oil	1	27K-33A	2X1 Machine	1
27K-34A	2X1 - Oil	1	27K-34A	2X1 Machine	1
27K-35A	2X1 - Oil	1	27K-35A	2X1 Machine	1
27K-36A	2X1 - Oil	1	27K-36A	2X1 Machine	1
27K-37A	2X1 - Oil	1	27K-37A	2X1 Machine	1
27K-38A	2X1 - Oil	1	27K-38A	2X1 Machine	1
27K-39A	2X1 - Oil	1	27K-39A	2X1 Machine	1
27K-40A	2X1 - Oil	1	27K-40A	2X1 Machine	1
27K-41A	2X1 - Oil	1	27K-41A	2X1 Machine	1
27K-42A	2X1 - Oil	1	27K-42A	2X1 Machine	1
27K-43A	2X1 - Oil	1	27K-43A	2X1 Machine	1
27K-44A	2X1 - Oil	1	27K-44A	2X1 Machine	1
27K-45A	2X1 - Oil	1	27K-45A	2X1 Machine	1
27K-46A	2X1 - Oil	1	27K-46A	2X1 Machine	1
27K-47A	2X1 - Oil	1	27K-47A	2X1 Machine	1
27K-48A	2X1 - Oil	1	27K-48A	2X1 Machine	1
27K-49A	2X1 - Oil	1	27K-49A	2X1 Machine	1
27K-50A	2X1 - Oil	1	27K-50A	2X1 Machine	1
27K-51A	2X1 - Oil	1	27K-51A	2X1 Machine	1
27K-52A	2X1 - Oil	1	27K-52A	2X1 Machine	1
27K-53A	2X1 - Oil	1	27K-53A	2X1 Machine	1
27K-54A	2X1 - Oil	1	27K-54A	2X1 Machine	1
27K-55A	2X1 - Oil	1	27K-55A	2X1 Machine	1
27K-56A	2X1 - Oil	1	27K-56A	2X1 Machine	1
27K-57A	2X1 - Oil	1	27K-57A	2X1 Machine	1
27K-58A	2X1 - Oil	1	27K-58A	2X1 Machine	1
27K-59A	2X1 - Oil	1	27K-59A	2X1 Machine	1
27K-60A	2X1 - Oil	1	27K-60A	2X1 Machine	1
27K-61A	2X1 - Oil	1	27K-61A	2X1 Machine	1
27K-62A	2X1 - Oil	1	27K-62A	2X1 Machine	1
27K-63A	2X1 - Oil	1	27K-63A	2X1 Machine	1
27K-64A	2X1 - Oil	1	27K-64A	2X1 Machine	1
27K-65A	2X1 - Oil	1	27K-65A	2X1 Machine	1
27K-66A	2X1 - Oil	1	27K-66A	2X1 Machine	1
27K-67A	2X1 - Oil	1	27K-67A	2X1 Machine	1
27K-68A	2X1 - Oil	1	27K-68A	2X1 Machine	1
27K-69A	2X1 - Oil	1	27K-69A	2X1 Machine	1
27K-70A	2X1 - Oil	1	27K-70A	2X1 Machine	1
27K-71A	2X1 - Oil	1	27K-71A	2X1 Machine	1
27K-72A	2X1 - Oil	1	27K-72A	2X1 Machine	1
27K-73A	2X1 - Oil	1	27K-73A	2X1 Machine	1
27K-74A	2X1 - Oil	1	27K-74A	2X1 Machine	1
27K-75A	2X1 - Oil	1	27K-75A	2X1 Machine	1
27K-76A	2X1 - Oil	1	27K-76A	2X1 Machine	1
27K-77A	2X1 - Oil	1	27K-77A	2X1 Machine	1
27K-78A	2X1 - Oil	1	27K-78A	2X1 Machine	1
27K-79A	2X1 - Oil	1	27K-79A	2X1 Machine	1
27K-80A	2X1 - Oil	1	27K-80A	2X1 Machine	1
27K-81A	2X1 - Oil	1	27K-81A	2X1 Machine	1
27K-82A	2X1 - Oil	1	27K-82A	2X1 Machine	1
27K-83A	2X1 - Oil	1	27K-83A	2X1 Machine	1
27K-84A	2X1 - Oil	1	27K-84A	2X1 Machine	1
27K-85A	2X1 - Oil	1	27K-85A	2X1 Machine	1
27K-86A	2X1 - Oil	1	27K-86A	2X1 Machine	1
27K-87A	2X1 - Oil	1	27K-87A	2X1 Machine	1
27K-88A	2X1 - Oil	1	27K-88A	2X1 Machine	1
27K-89A	2X1 - Oil	1	27K-89A	2X1 Machine	1
27K-90A	2X1 - Oil	1	27K-90A	2X1 Machine	1
27K-91A	2X1 - Oil	1	27K-91A	2X1 Machine	1
27K-92A	2X1 - Oil	1	27K-92A	2X1 Machine	1
27K-93A	2X1 - Oil	1	27K-93A	2X1 Machine	1
27K-94A	2X1 - Oil	1	27K-94A	2X1 Machine	1
27K-95A	2X1 - Oil	1	27K-95A	2X1 Machine	1
27K-96A	2X1 - Oil	1	27K-96A	2X1 Machine	1
27K-97A	2X1 - Oil	1	27K-97A	2X1 Machine	1
27K-98A	2X1 - Oil	1	27K-98A	2X1 Machine	1
27K-99A	2X1 - Oil	1	27K-99A	2X1 Machine	1
27K-100A	2X1 - Oil	1	27K-100A	2X1 Machine	1

CROSS FEED SCREW



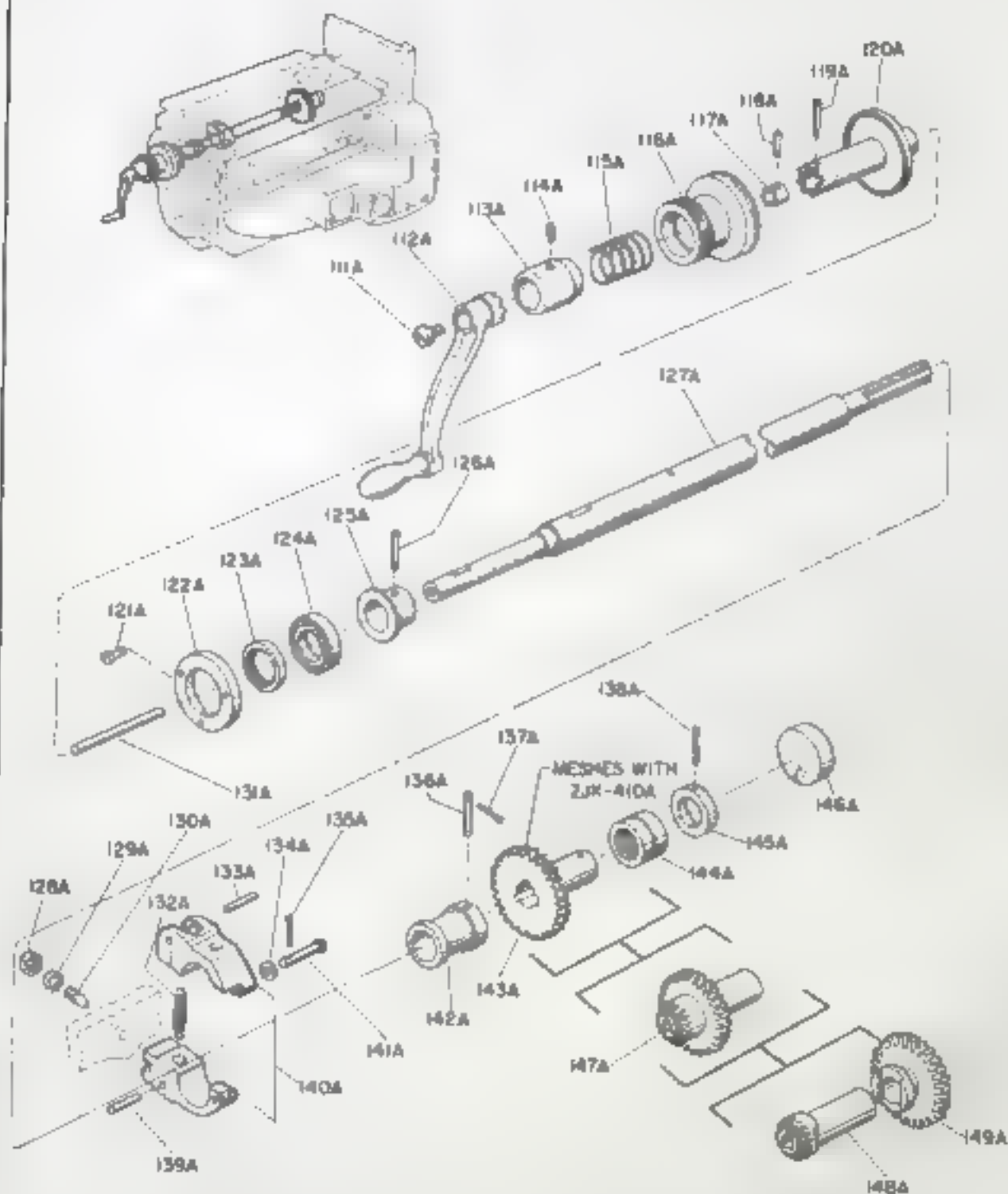
CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

KNEE — UNIT No. 2JK (Continued) 2MI, 2MI AND 3MI PLAN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Qty. Used	Key No.	Part No.	Part Name	Qty. Used
27K-70A	3414	Screw - Retaining	1	27K-84A	3380	Shog - Bolt	1
27K-71A		Washers	1	27K-85A	111402	Nut - Cross Feed	1
	101093	2MI, 2MI Machine	1	27K-86A	01336	Seal - Oil	1
	101063	2MI Machine	1	27K-87A	110309	Washing - Cross Feed - Front	1
27K-72A	101060	Clutch - Handstop	1	27K-88A	03437	Pin - Box Head Taper	1
27K-73A	3333	Screw - Set	1	27K-89A	111131	Bearing - Needle	1
27K-74A	102063	Spring	1	27K-90A		Gear - Cross Feed	1
27K-75A	102063	Plug	1		111130	2MI, 2MI Machine	1
27K-76A	04234	Pin - Collar	1		114283	2MI Machine	1
27K-77A	043	Pin - Taper	1	27K-91A	131060	Washer	1
27K-78A	113301	Clutch - Cross Feed Dial	1	27K-92A	114330	Shims - Cross Feed	1
27K-79A	111467	Nut - Bearing Retainer	1	27K-93A	77401	Plug	1
27K-80A	3390	Ring - Pin	1	27K-94A		Clutch - Cross Feed	1
27K-81A	75110	Cap - Bearing	1		111131	2MI, 2MI Machine	1
27K-82A	75111	Cap - Bearing	1		114304	2MI Machine	1
27K-83A	111464	Washing - Spring Washer	1	27K-95A	121060	Bracket	1
27K-84A	113302	Dial - Cross Feed	1		111130	Gear - Cross Feed	1
27K-85A	00109	Collar - Small	1		114787	2MI Machine	1
27K-86A	114380	Nut - Knockout - Cross	1	27K-97A	111121	Bearing - Needle	1
27K-87A	3390	Screw - Set	1	27K-98A	114378	Washing - Cross Feed Gear	1
27K-88A		Screw - Cross	1	27K-99A	01336	Plug	1
	110433	2MI, 2MI, Plan and Universal Machine	1	27K-100A	121062	Screw	1
	110443	2MI Vertical Machine	1	27K-101A	111130	Cap - Mill	1
	110464	2MI Machine	1	27K-102A	111137	Bearing - Needle	1
27K-89A	75111	Cap - Bearing	1	27K-103A	111143	Spacer - Mill Gear	1
27K-90A	75110	Cap - Bearing	1	27K-104A	111137	Bearing - Needle	1
27K-91A	110439	Collar - Knockout - Cross Feed	1	27K-105A	111134	Washer	1
27K-92A	111463	Pin - Collar	1	27K-106A	111060	Wash - Mill Gear	1
27K-93A		Washer - Seal	1	27K-107A	01336	Pin - Straight	1
	110431	2MI, 2MI Machine	1	27K-108A	104303	Screw - Stud	1
	110400	2MI Machine	1				

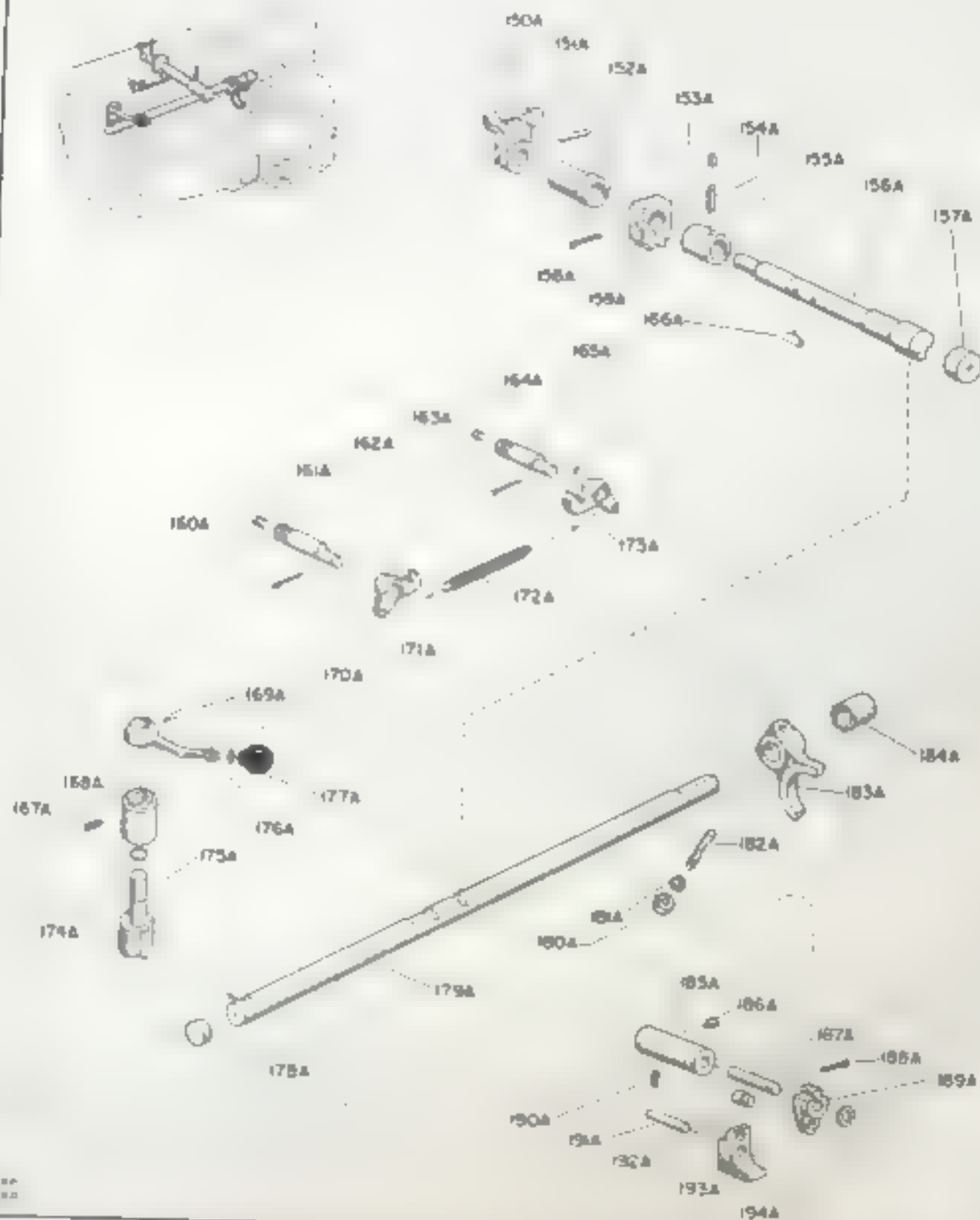
ELEVATING SHAFT



WHEN ORDERING PARTS give leg number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 39, "How to Order Repair Parts."

Key No	Part Name	Unit	Key No	Part Name	Unit
23K-111A	1814	1	23K-112A	1815	1
23K-112A	1816	1	23K-113A	1817	1
23K-113A	1818	1	23K-114A	1819	1
23K-114A	1820	1	23K-115A	1821	1
23K-115A	1822	1	23K-116A	1823	1
23K-116A	1824	1	23K-117A	1825	1
23K-117A	1826	1	23K-118A	1827	1
23K-118A	1828	1	23K-119A	1829	1
23K-119A	1830	1	23K-120A	1831	1
23K-120A	1832	1	23K-121A	1833	1
23K-121A	1834	1	23K-122A	1835	1
23K-122A	1836	1	23K-123A	1837	1
23K-123A	1838	1	23K-124A	1839	1
23K-124A	1840	1	23K-125A	1841	1
23K-125A	1842	1	23K-126A	1843	1
23K-126A	1844	1	23K-127A	1845	1
23K-127A	1846	1	23K-128A	1847	1
23K-128A	1848	1	23K-129A	1849	1
23K-129A	1850	1	23K-130A	1851	1
23K-130A	1852	1	23K-131A	1853	1
23K-131A	1854	1	23K-132A	1855	1
23K-132A	1856	1	23K-133A	1857	1
23K-133A	1858	1	23K-134A	1859	1
23K-134A	1860	1	23K-135A	1861	1
23K-135A	1862	1	23K-136A	1863	1
23K-136A	1864	1	23K-137A	1865	1
23K-137A	1866	1	23K-138A	1867	1
23K-138A	1868	1	23K-139A	1869	1
23K-139A	1870	1	23K-140A	1871	1
23K-140A	1872	1	23K-141A	1873	1
23K-141A	1874	1	23K-142A	1875	1
23K-142A	1876	1	23K-143A	1877	1
23K-143A	1878	1	23K-144A	1879	1
23K-144A	1880	1	23K-145A	1881	1
23K-145A	1882	1	23K-146A	1883	1
23K-146A	1884	1	23K-147A	1885	1
23K-147A	1886	1	23K-148A	1887	1
23K-148A	1888	1	23K-149A	1889	1
23K-149A	1890	1	23K-150A	1891	1
23K-150A	1892	1	23K-151A	1893	1
23K-151A	1894	1	23K-152A	1895	1
23K-152A	1896	1	23K-153A	1897	1
23K-153A	1898	1	23K-154A	1899	1
23K-154A	1900	1	23K-155A	1901	1
23K-155A	1902	1	23K-156A	1903	1
23K-156A	1904	1	23K-157A	1905	1
23K-157A	1906	1	23K-158A	1907	1
23K-158A	1908	1	23K-159A	1909	1
23K-159A	1910	1	23K-160A	1911	1
23K-160A	1912	1	23K-161A	1913	1
23K-161A	1914	1	23K-162A	1915	1
23K-162A	1916	1	23K-163A	1917	1
23K-163A	1918	1	23K-164A	1919	1
23K-164A	1920	1	23K-165A	1921	1
23K-165A	1922	1	23K-166A	1923	1
23K-166A	1924	1	23K-167A	1925	1
23K-167A	1926	1	23K-168A	1927	1
23K-168A	1928	1	23K-169A	1929	1
23K-169A	1930	1	23K-170A	1931	1
23K-170A	1932	1	23K-171A	1933	1
23K-171A	1934	1	23K-172A	1935	1
23K-172A	1936	1	23K-173A	1937	1
23K-173A	1938	1	23K-174A	1939	1
23K-174A	1940	1	23K-175A	1941	1
23K-175A	1942	1	23K-176A	1943	1

CROSS FEED CONTROL



CINCINNATI NOS. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete key number for your machine. For complete instructions see Page 79, "How to Order Repair Parts."

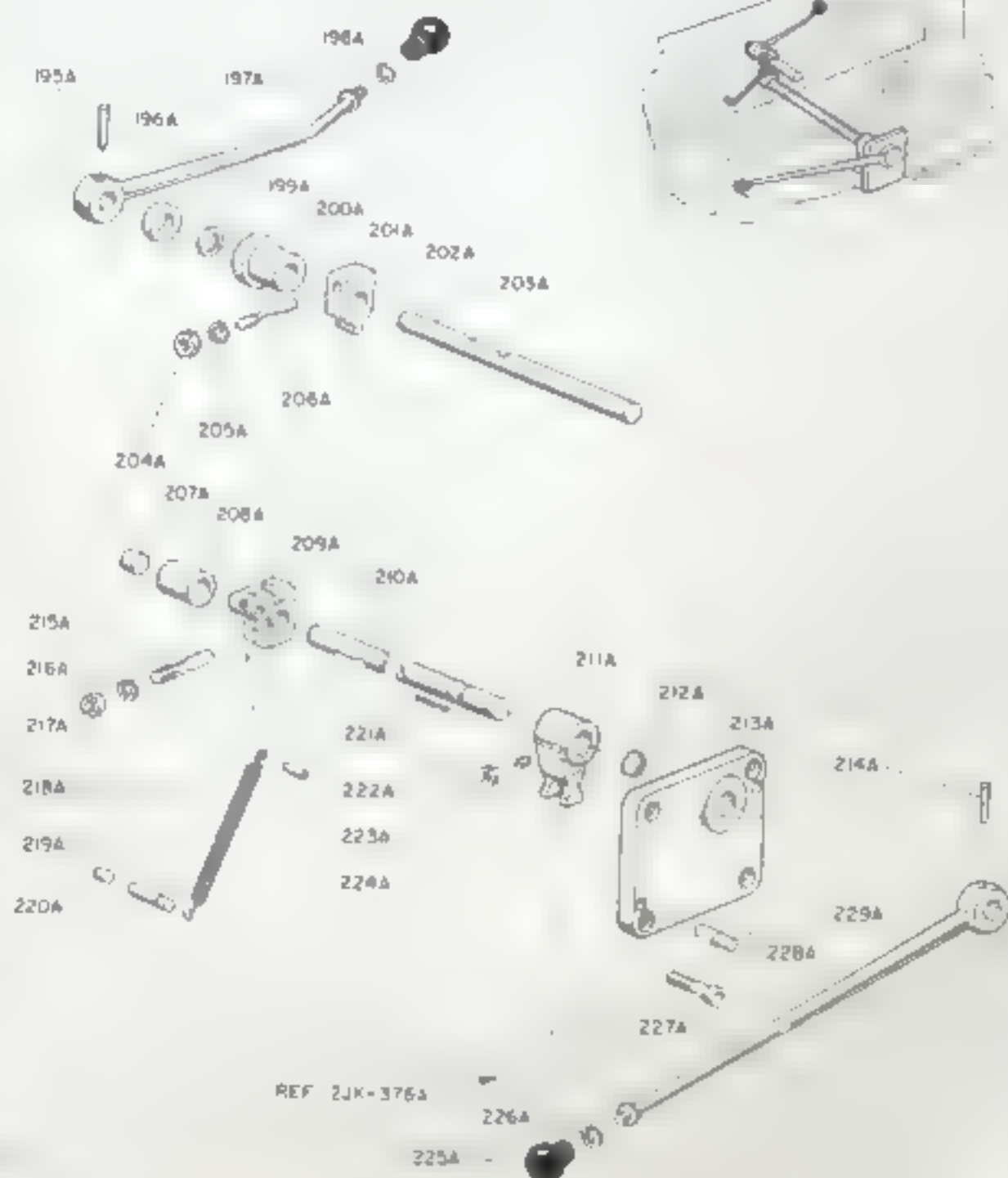
KNEE — UNIT No. 2JK (Continued)

2M, 2M AND 3M PLAIN AND UNIVERSAL

2M VERTICAL

Key No.	Part No.	Part Name	Key No.	Part No.	Part Name	Key No.
2JK-190A	11144	Key - Lever - Cross Feed	2JK-172A	11186	Roller - Front Cross Feed	1
2JK-191A	11145	Pin - Lever	2JK-173A	11187	Lever - Front Cross Feed	1
2JK-192A	11146	Rolling - Cross Feed Guide	2JK-174A	11188	Roll - Guide	1
	11147	Roll - Guide	2JK-175A	11189	Roll - Guide	1
2JK-193A	11148	Roll - Guide	2JK-176A	11190	Roll - Guide	1
2JK-194A	11149	Roll - Guide	2JK-177A	11191	Roll - Guide	1
2JK-195A	11150	Roll - Guide	2JK-178A	11192	Roll - Guide	1
2JK-196A	11151	Roll - Guide	2JK-179A	11193	Roll - Guide	1
2JK-197A	11152	Roll - Guide	2JK-180A	11194	Roll - Guide	1
2JK-198A	11153	Roll - Guide	2JK-181A	11195	Roll - Guide	1
2JK-199A	11154	Roll - Guide	2JK-182A	11196	Roll - Guide	1
2JK-200A	11155	Roll - Guide	2JK-183A	11197	Roll - Guide	1
2JK-201A	11156	Roll - Guide	2JK-184A	11198	Roll - Guide	1
2JK-202A	11157	Roll - Guide	2JK-185A	11199	Roll - Guide	1
2JK-203A	11158	Roll - Guide	2JK-186A	11200	Roll - Guide	1
2JK-204A	11159	Roll - Guide	2JK-187A	11201	Roll - Guide	1
2JK-205A	11160	Roll - Guide	2JK-188A	11202	Roll - Guide	1
2JK-206A	11161	Roll - Guide	2JK-189A	11203	Roll - Guide	1
2JK-207A	11162	Roll - Guide	2JK-190A	11204	Roll - Guide	1
2JK-208A	11163	Roll - Guide	2JK-191A	11205	Roll - Guide	1
2JK-209A	11164	Roll - Guide	2JK-192A	11206	Roll - Guide	1
2JK-210A	11165	Roll - Guide	2JK-193A	11207	Roll - Guide	1
2JK-211A	11166	Roll - Guide	2JK-194A	11208	Roll - Guide	1
2JK-212A	11167	Roll - Guide	2JK-195A	11209	Roll - Guide	1
2JK-213A	11168	Roll - Guide	2JK-196A	11210	Roll - Guide	1
2JK-214A	11169	Roll - Guide	2JK-197A	11211	Roll - Guide	1
2JK-215A	11170	Roll - Guide	2JK-198A	11212	Roll - Guide	1
2JK-216A	11171	Roll - Guide	2JK-199A	11213	Roll - Guide	1
2JK-217A	11172	Roll - Guide	2JK-200A	11214	Roll - Guide	1
2JK-218A	11173	Roll - Guide	2JK-201A	11215	Roll - Guide	1
2JK-219A	11174	Roll - Guide	2JK-202A	11216	Roll - Guide	1
2JK-220A	11175	Roll - Guide	2JK-203A	11217	Roll - Guide	1
2JK-221A	11176	Roll - Guide	2JK-204A	11218	Roll - Guide	1
2JK-222A	11177	Roll - Guide	2JK-205A	11219	Roll - Guide	1
2JK-223A	11178	Roll - Guide	2JK-206A	11220	Roll - Guide	1
2JK-224A	11179	Roll - Guide	2JK-207A	11221	Roll - Guide	1
2JK-225A	11180	Roll - Guide	2JK-208A	11222	Roll - Guide	1
2JK-226A	11181	Roll - Guide	2JK-209A	11223	Roll - Guide	1
2JK-227A	11182	Roll - Guide	2JK-210A	11224	Roll - Guide	1
2JK-228A	11183	Roll - Guide	2JK-211A	11225	Roll - Guide	1
2JK-229A	11184	Roll - Guide	2JK-212A	11226	Roll - Guide	1
2JK-230A	11185	Roll - Guide	2JK-213A	11227	Roll - Guide	1
2JK-231A	11186	Roll - Guide	2JK-214A	11228	Roll - Guide	1
2JK-232A	11187	Roll - Guide	2JK-215A	11229	Roll - Guide	1
2JK-233A	11188	Roll - Guide	2JK-216A	11230	Roll - Guide	1
2JK-234A	11189	Roll - Guide	2JK-217A	11231	Roll - Guide	1
2JK-235A	11190	Roll - Guide	2JK-218A	11232	Roll - Guide	1
2JK-236A	11191	Roll - Guide	2JK-219A	11233	Roll - Guide	1
2JK-237A	11192	Roll - Guide	2JK-220A	11234	Roll - Guide	1
2JK-238A	11193	Roll - Guide	2JK-221A	11235	Roll - Guide	1
2JK-239A	11194	Roll - Guide	2JK-222A	11236	Roll - Guide	1
2JK-240A	11195	Roll - Guide	2JK-223A	11237	Roll - Guide	1
2JK-241A	11196	Roll - Guide	2JK-224A	11238	Roll - Guide	1
2JK-242A	11197	Roll - Guide	2JK-225A	11239	Roll - Guide	1
2JK-243A	11198	Roll - Guide	2JK-226A	11240	Roll - Guide	1
2JK-244A	11199	Roll - Guide	2JK-227A	11241	Roll - Guide	1
2JK-245A	11200	Roll - Guide	2JK-228A	11242	Roll - Guide	1
2JK-246A	11201	Roll - Guide	2JK-229A	11243	Roll - Guide	1
2JK-247A	11202	Roll - Guide	2JK-230A	11244	Roll - Guide	1
2JK-248A	11203	Roll - Guide	2JK-231A	11245	Roll - Guide	1
2JK-249A	11204	Roll - Guide	2JK-232A	11246	Roll - Guide	1
2JK-250A	11205	Roll - Guide	2JK-233A	11247	Roll - Guide	1
2JK-251A	11206	Roll - Guide	2JK-234A	11248	Roll - Guide	1
2JK-252A	11207	Roll - Guide	2JK-235A	11249	Roll - Guide	1
2JK-253A	11208	Roll - Guide	2JK-236A	11250	Roll - Guide	1
2JK-254A	11209	Roll - Guide	2JK-237A	11251	Roll - Guide	1
2JK-255A	11210	Roll - Guide	2JK-238A	11252	Roll - Guide	1
2JK-256A	11211	Roll - Guide	2JK-239A	11253	Roll - Guide	1
2JK-257A	11212	Roll - Guide	2JK-240A	11254	Roll - Guide	1
2JK-258A	11213	Roll - Guide	2JK-241A	11255	Roll - Guide	1
2JK-259A	11214	Roll - Guide	2JK-242A	11256	Roll - Guide	1
2JK-260A	11215	Roll - Guide	2JK-243A	11257	Roll - Guide	1
2JK-261A	11216	Roll - Guide	2JK-244A	11258	Roll - Guide	1
2JK-262A	11217	Roll - Guide	2JK-245A	11259	Roll - Guide	1
2JK-263A	11218	Roll - Guide	2JK-246A	11260	Roll - Guide	1
2JK-264A	11219	Roll - Guide	2JK-247A	11261	Roll - Guide	1
2JK-265A	11220	Roll - Guide	2JK-248A	11262	Roll - Guide	1
2JK-266A	11221	Roll - Guide	2JK-249A	11263	Roll - Guide	1
2JK-267A	11222	Roll - Guide	2JK-250A	11264	Roll - Guide	1
2JK-268A	11223	Roll - Guide	2JK-251A	11265	Roll - Guide	1
2JK-269A	11224	Roll - Guide	2JK-252A	11266	Roll - Guide	1
2JK-270A	11225	Roll - Guide	2JK-253A	11267	Roll - Guide	1
2JK-271A	11226	Roll - Guide	2JK-254A	11268	Roll - Guide	1
2JK-272A	11227	Roll - Guide	2JK-255A	11269	Roll - Guide	1
2JK-273A	11228	Roll - Guide	2JK-256A	11270	Roll - Guide	1
2JK-274A	11229	Roll - Guide	2JK-257A	11271	Roll - Guide	1
2JK-275A	11230	Roll - Guide	2JK-258A	11272	Roll - Guide	1
2JK-276A	11231	Roll - Guide	2JK-259A	11273	Roll - Guide	1
2JK-277A	11232	Roll - Guide	2JK-260A	11274	Roll - Guide	1
2JK-278A	11233	Roll - Guide	2JK-261A	11275	Roll - Guide	1
2JK-279A	11234	Roll - Guide	2JK-262A	11276	Roll - Guide	1
2JK-280A	11235	Roll - Guide	2JK-263A	11277	Roll - Guide	1
2JK-281A	11236	Roll - Guide	2JK-264A	11278	Roll - Guide	1
2JK-282A	11237	Roll - Guide	2JK-265A	11279	Roll - Guide	1
2JK-283A	11238	Roll - Guide	2JK-266A	11280	Roll - Guide	1
2JK-284A	11239	Roll - Guide	2JK-267A	11281	Roll - Guide	1
2JK-285A	11240	Roll - Guide	2JK-268A	11282	Roll - Guide	1
2JK-286A	11241	Roll - Guide	2JK-269A	11283	Roll - Guide	1
2JK-287A	11242	Roll - Guide	2JK-270A	11284	Roll - Guide	1
2JK-288A	11243	Roll - Guide	2JK-271A	11285	Roll - Guide	1

RAPID TRAVERSE CONTROL



CINCINNATI NOS. 2 ML, 3 ML AND 3 ML MILLING MACHINES

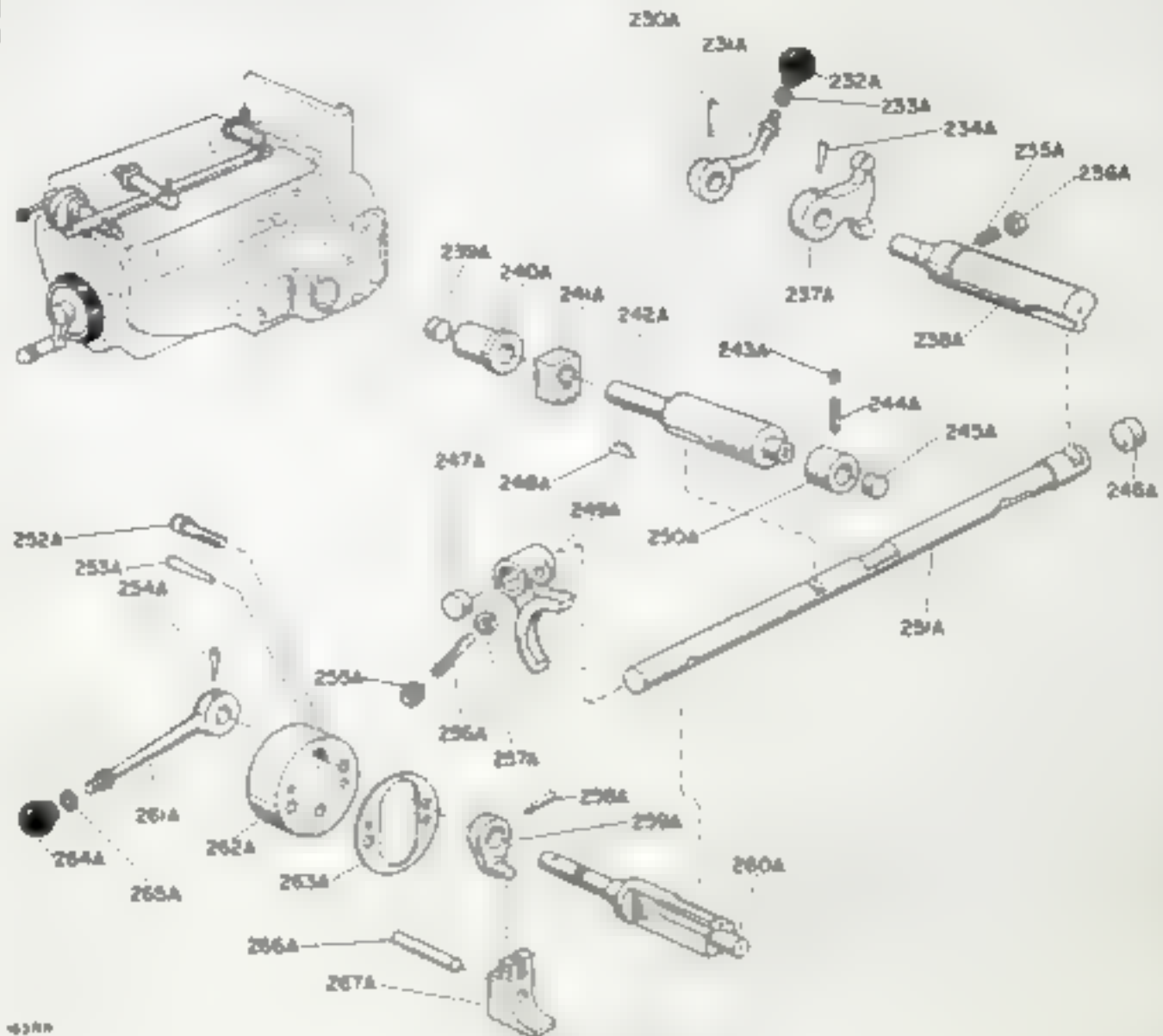
WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 19, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

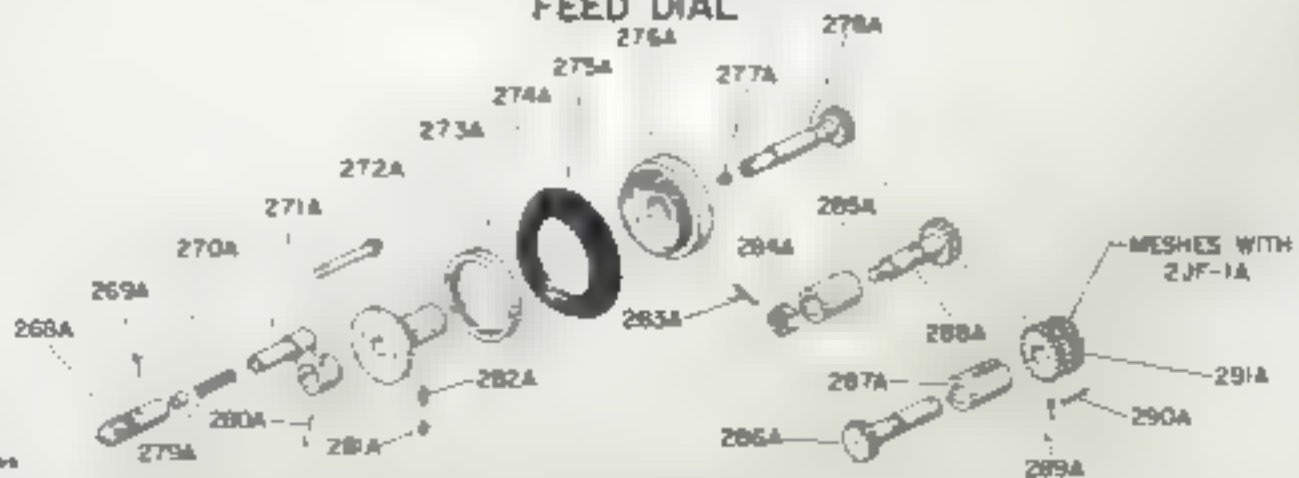
2ML, 2ML AND 3ML PLAIN AND UNIVERSAL
2ML VERTICAL

Key No.	Part No.	Part Name	Unit Used	Key No.	Part No.	Part Name	Unit Used
2JK-192A	842	Pin - Taper	1	2JK-212A	127448	Ring - "C"	1
2JK-194A	115818	Lever - Rear Rapid Traverse	1	2JK-212A		Cover - Rapid Traverse Control	1
2JK-195A	8115	Washer - Lock	1	2JK-212A	127449	2ML, 2ML Machines	1
2JK-196A	110023	Bolt - Washer	1	2JK-212A	127450	2ML Machines	1
2JK-196A	128847	Washer - Control Shaft	1	2JK-212A	842	Pin - Taper	1
2JK-200A	212408	Seal - Oil	1	2JK-212A	98907	Pin - Locking	1
2JK-201A		Pushing - Rear Rapid Traverse Shaft	1	2JK-212A	2121	Washer - Lock	1
	115821	2ML, 2ML Machines	1	2JK-212A	2122	Pin - Oil	1
	115822	2ML Machines	1	2JK-212A	115823	Spring - Rapid Traverse Lever	1
2JK-202A	115824	Lever - Rear Rapid Traverse Locking	1	2JK-212A	2123	Pin - Straight	1
2JK-203A		Shaft - Control - Rear Rapid Traverse	1	2JK-212A	2124	Pin - Straight	1
	115844	2ML, 2ML Machines	1	2JK-212A	1425	Key	1
	115845	2ML Machines	1	2JK-212A	1426	Pin - Straight	1
2JK-204A	2124	Nut - Key	1	2JK-212A	1427	Nut - Key	1
2JK-205A	2125	Washer - Lock	1	2JK-212A	1428	Seal - Oil	1
2JK-206A	98907	Pin - Locking	1	2JK-212A	115823	Ball - Needle	1
2JK-207A	2126	Pin - Locking	1	2JK-212A	2129	Washer - Lock	1
2JK-208A		Pushing - Rapid Traverse Shaft	1	2JK-212A		Lever - Rapid Rapid Traverse	1
	115823	2ML, 2ML Machines	1		115823	2ML, 2ML Machines	1
	115824	2ML Machines	1		115824	2ML Machines	1
2JK-209A	115825	Lever - Rapid Traverse Spring	1	2JK-212A	2124	Seal - Oil	1
2JK-210A		Shaft - Rapid Traverse Control	1	2JK-212A	2125	Pin	1
	115845	2ML, 2ML Machines	1				
	115846	2ML Machines	1				
2JK-211A		Pin - Rapid Traverse Shaft	1				
	115844	2ML, 2ML Machines	1				
	115845	2ML Machines	1				

VERTICAL FEED CONTROL



FEED DIAL



CINCINNATI NOS 2 ML, 2 MI AND 3 MI MILLING MACHINES

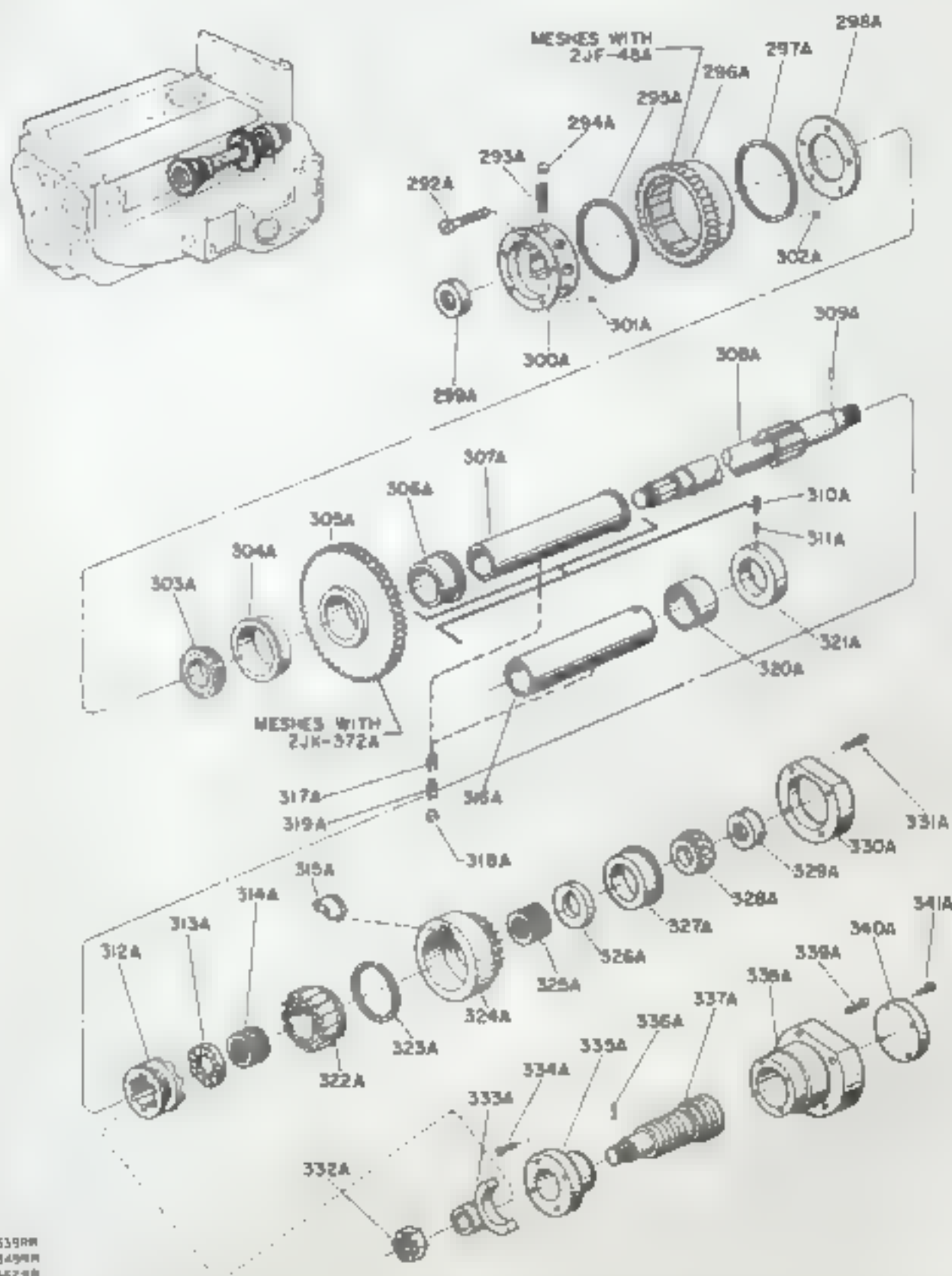
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

3 MI, 2 MI AND 2 ML PLAIN AND UNIVERSAL 2 MI VERTICAL

Key No.	Part No.	Part Name	Assy. Desc.	Key No.	Part No.	Part Name	Assy. Desc.
2JK-230A	843	Pin - Taper	1	2JK-236A	143	Pin - Taper	1
2JK-231A	133367	Lever - Rear Elevating (With Rear Control)	1	2JK-236A	134640	Trip - Elevating Control Shaft	1
2JK-232A	113033	Ball - Handle (With Rear Control)	1	2JK-236A	113104	Shaft - Vertical Control	1
2JK-233A	8116	Washer - Lock (With Rear Control)	1	2JK-236A	113334	2MI, 2ML Machines	1
2JK-234A	810	Pin - Taper	1	2JK-236A	113344	2MI Machines	1
2JK-234A	2332	Screw - Set	1	2JK-236A	2133	Lever - Elevating	1
2JK-234A	2332	2MI, 2ML Machines	1	2JK-236A	113344	Pin - Vertical Control Shaft	1
2JK-234A	2332	2MI Machines	1	2JK-236A	2133	Gasket	1
2JK-234A	2433	Nut - Hex (2MI Machines Only)	1	2JK-236A	2133	Washer - Lock	1
2JK-237A	111794	Lever - Elevating Trip	1	2JK-236A	113344	Ball - Handle	1
2JK-238A	111720	Shaft - Rear Elevating	1	2JK-236A	113344	Pin - Vertical Control Shaft	1
		2MI, 2ML Machines Without Rear Control	1	2JK-236A	113344	Shaft - Elevating Knob	1
		2MI Machines Without Rear Control	1	2JK-236A	113344	Knob - Feed Change	1
		2MI, 2ML Machines With Rear Control	1	2JK-236A	2133	Pin - Taper	1
		2MI Machines With Rear Control	1	2JK-236A	113344	Washer - Feed Change	1
2JK-239A	2130	Pin	1	2JK-236A	113344	Lever - Feed Change	1
2JK-240A	113047	Washer - Buffer Shaft	1	2JK-236A	113344	Pin - Feed Change Index	1
2JK-241A	111794	Washer - Control Rod	1	2JK-236A	113344	Plate - Feed Change Index	1
2JK-241A	111794	Shaft - Elevating Buffer	1	2JK-236A	113344	Nut - Feed Change	1
		2MI, 2ML Machines	1	2JK-236A	113344	Dial - Feed	1
		2MI Machines	1	2JK-236A	113344	1/3 x 40	1
2JK-242A	8211	Screw - Set	1	2JK-236A	113344	1/4 x 40	1
2JK-242A	8217	Screw - Set	1	2JK-236A	113344	Gear - Internal - Feed Change	1
2JK-242A	8248	Pin	1	2JK-236A	217781	Screw - Set	1
2JK-242A	20413	Pin	1	2JK-236A	113344	Shaft - Feed Change	1
2JK-242A	20413	Pin	1	2JK-236A	253	Spring	1
2JK-242A	2280	Key	1	2JK-236A	143	Pin - Taper	1
2JK-242A		For - Gear Buffer	1	2JK-236A	2133	Screw - Set	1
	114679	2MI, 2ML Machines	1	2JK-236A	2133	Screw - Set	1
	113048	2MI Machines	1	2JK-236A	2093	Pin - Cam	1
2JK-242A	113048	Washer - Buffer Shaft	1	2JK-236A	113344	Nut - Milled	1
		2MI, 2ML, Plain and Universal Machines	1	2JK-236A	113344	Washer	1
		2MI Vertical Machines	1	2JK-236A	113344	Shaft - Driving	1
		2MI Machines	1	2JK-236A	113344	2MI and Universal Machines	1
2JK-242A	2251	Screw	1	2JK-236A	113344	Various Machines	1
2JK-242A	843	Pin - Taper	1	2JK-236A	113344	Washer - Driving Shaft	1
2JK-242A	843	Pin - Taper	1	2JK-236A	113344	2MI and Universal Machines	1
2JK-242A	8144	Pin - Hex	1	2JK-236A	113344	Vertical Machines	1
2JK-242A		Pin - Locking	1	2JK-236A	113344	Gear - Intermediate Feed	1
	84307	2MI, 2ML Machines	1	2JK-236A	113344	Pin - Taper	1
	113048	2MI Machines	1	2JK-236A	2133	Pin - Cam	1
2JK-242A	2133	Washer - Lock	1	2JK-236A	113344	Gear - Primary Cam Shaft	1
				2JK-236A	113344	2MI, 2ML, Plain and Universal Machines	1
				2JK-236A	113344	2MI Vertical Machines	1
				2JK-236A	113344	2MI Machines	1

SAFETY GEAR SHAFT



539RM
349RM
462RM

CINCINNATI NOS 2 ML 2 MI AND 3 MI MILLING MACHINES

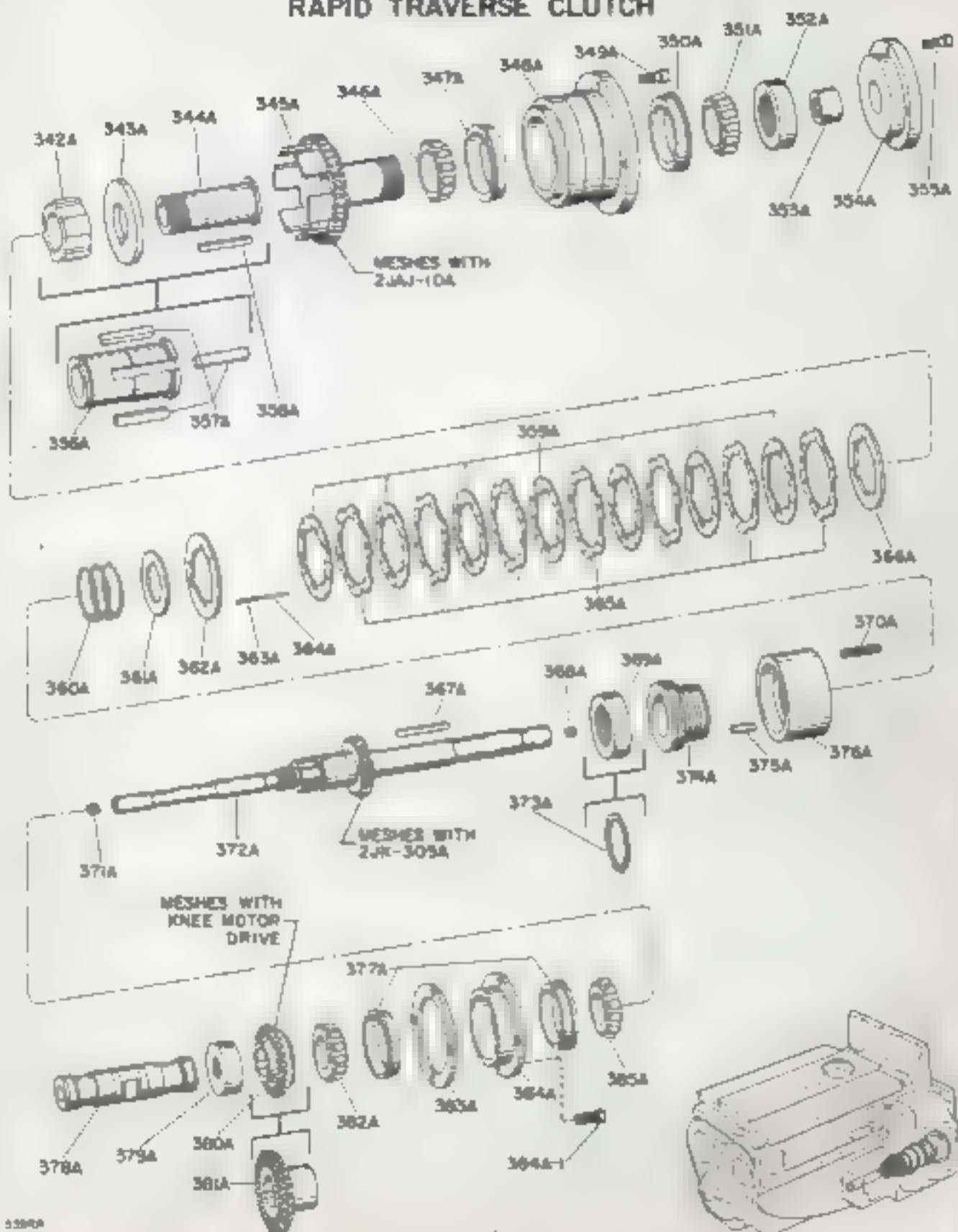
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 59, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL
2MI VERTICAL

Key No	Part No	Part Name	Am Used	Key No	Part No	Part Name	Am Used
2JK-283A	5387	Screw	1	2JK-319A	3339	Screw - Set	1
2JK-283A	105859	Spring - Start and Stop	10	2JK-319A	3664	Plug - Pipe	1
2JK-284A	30143	Nut - Steel	10	2JK-319A	3339	Screw - Set	1
2JK-295A	111563	Ring - Safety Gear Spacer	1	2JK-320A	114429	Bushing - Safety Gear (2nd Machine Only)	1
2JK-296A	108478	Gear - Safety	1	2JK-321A	114461	Co-Gear (2nd Machine Only)	1
2JK-297A	111183	Ring - Safety Gear Spacer	1	2JK-322A	114311	Roller - Clutch	1
2JK-298A	111144	Roller - Safety Gear	1	2JK-323A	111144	Ring - Roller Dogs	1
2JK-299A		Nut - Lock	1	2JK-324A		Gear Clutch	1
	4245	2ML, 2MI Machines	1		111181	2ML, 2MI Machines	1
	108874	2MI Machines	1		114121	2MI Machines	1
2JK-300A	108478	Body - Safety Gear	1	2JK-325A	111128	Bushing - Needle	1
2JK-301A	3290	End - Steel	10	2JK-326A	101391	Spacer - Roller Gear	1
2JK-302A	3290	End - Steel	10	2JK-327A	107710	Cup - Bearing	1
2JK-303A	111030	Cup - Bearing	1	2JK-328A	12003	Cup - Bearing	1
2JK-304A	107710	Cup - Bearing	1	2JK-329A	4213	Nut - Lock	1
2JK-305A		Gear - Feed Drive Miter	1	2JK-330A		Ring - Safety Gear Shaft	1
	101487	2ML, 2MI Machines	1		111401	2ML, 2MI Machines	1
	101481	2MI Machines	1		114391	2MI Machines	1
2JK-306A	101347	Bushing - Miter Gear (2nd ML Machine Only)	1	2JK-331A	2530	Seton	1
2JK-307A	101811	Bushing - Feed Drive Miter (2nd ML Machine Only)	1	2JK-332A	2087	Nut - Lock	1
2JK-308A		Shaft - Safety Gear	1		109439	2ML, 2MI Machines	1
	101810	2ML, 2MI Machines	1		109440	2MI Machines	1
	101811	2MI Machines	1	2JK-333A	3381	Screw	1
2JK-309A	1036	Pin	1	2JK-334A	101680	Spacer - Feed Clutch	1
2JK-310A	10670	Screw - Set (2nd Machine Only)	1	2JK-335A	1047	Pin - Clutch	1
2JK-311A	3270	Screw - Set (2nd Machine Only)	1	2JK-336A	101691	Clutch - Feed Clutch	1
2JK-312A	114324	Clutch - Feed Drive	1	2JK-337A	111511	Cylinder - Feed Clutch	1
2JK-313A	111154	Washer - Thrust	1	2JK-338A	1266	Roller	1
2JK-314A	111129	Bushing - Needle	1	2JK-339A	104141	Block - Feed Clutch Cylinder	1
2JK-315A	107710	Nut - Safety Gear	1	2JK-340A	3396	Screw	1
2JK-316A	107922	Bushing - Feed Drive Miter (2MI Machines Only)	1				

RAPID TRAVERSE CLUTCH



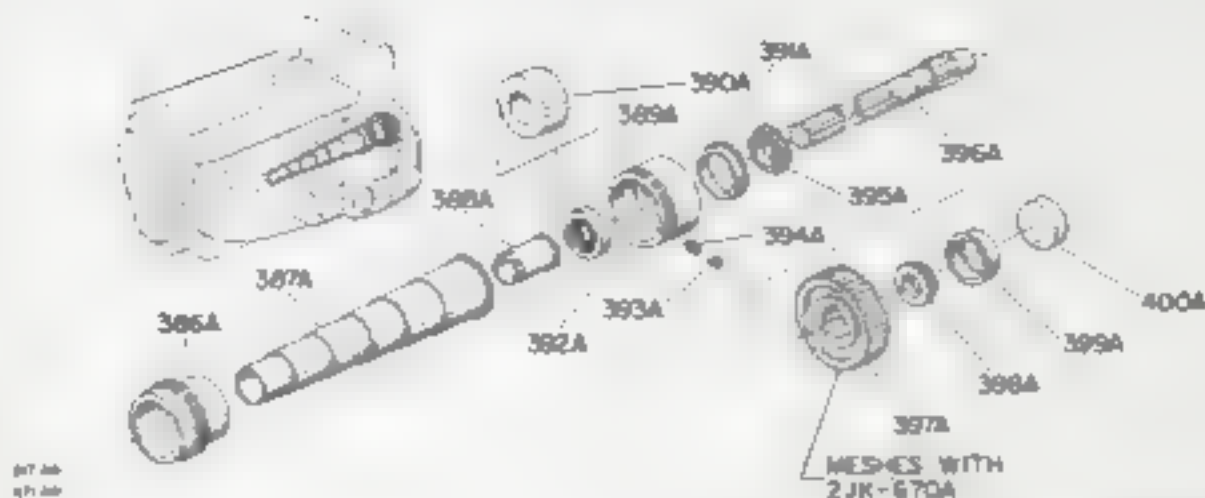
CINCINNATI NOS 2 MI, 8 MI AND 9 MI MILUNG MACHINES

WHEN ORDERING PARTS, give tag number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 15 "How to Order Repairs, Parts."

KNEE—UNIT No. 2JK (Continued)

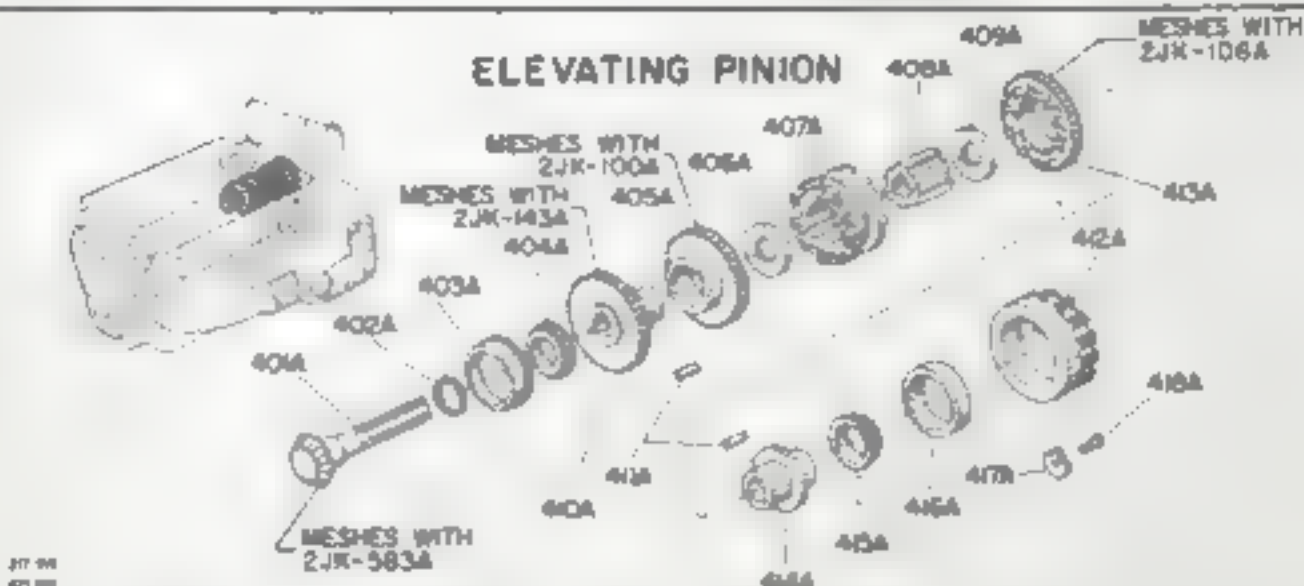
200L, 200M AND 300M PLAIN AND UNIVERSAL
300M VERTICAL[illegible]

SPLINE SHAFT



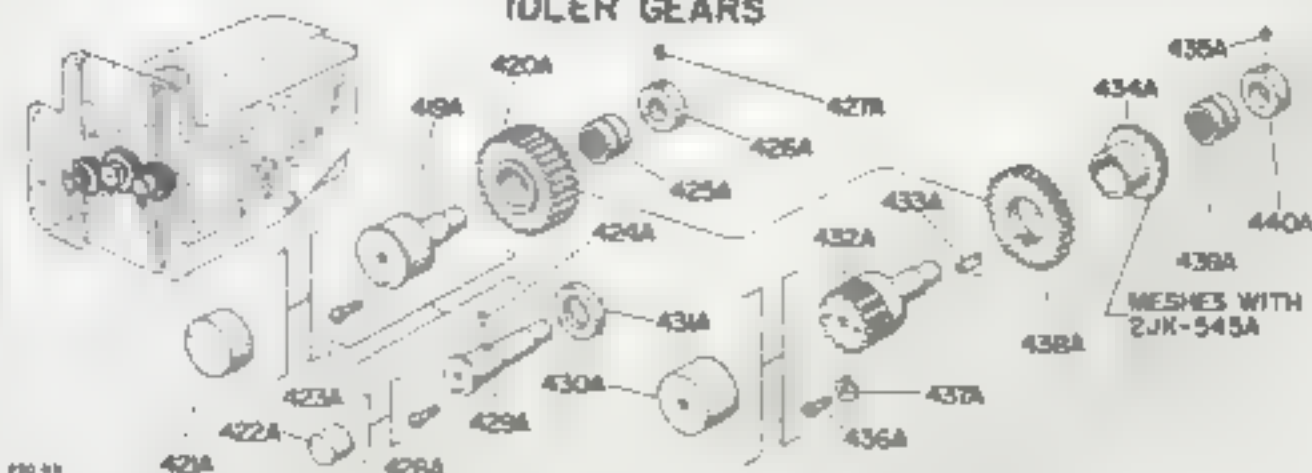
387 386
389 390

ELEVATING PINION



407 406
409 410

IDLER GEARS



427 426
429 430

CINCINNATI NOS 2 ML 2 MI AND 3 MI MILUNG MACHINES

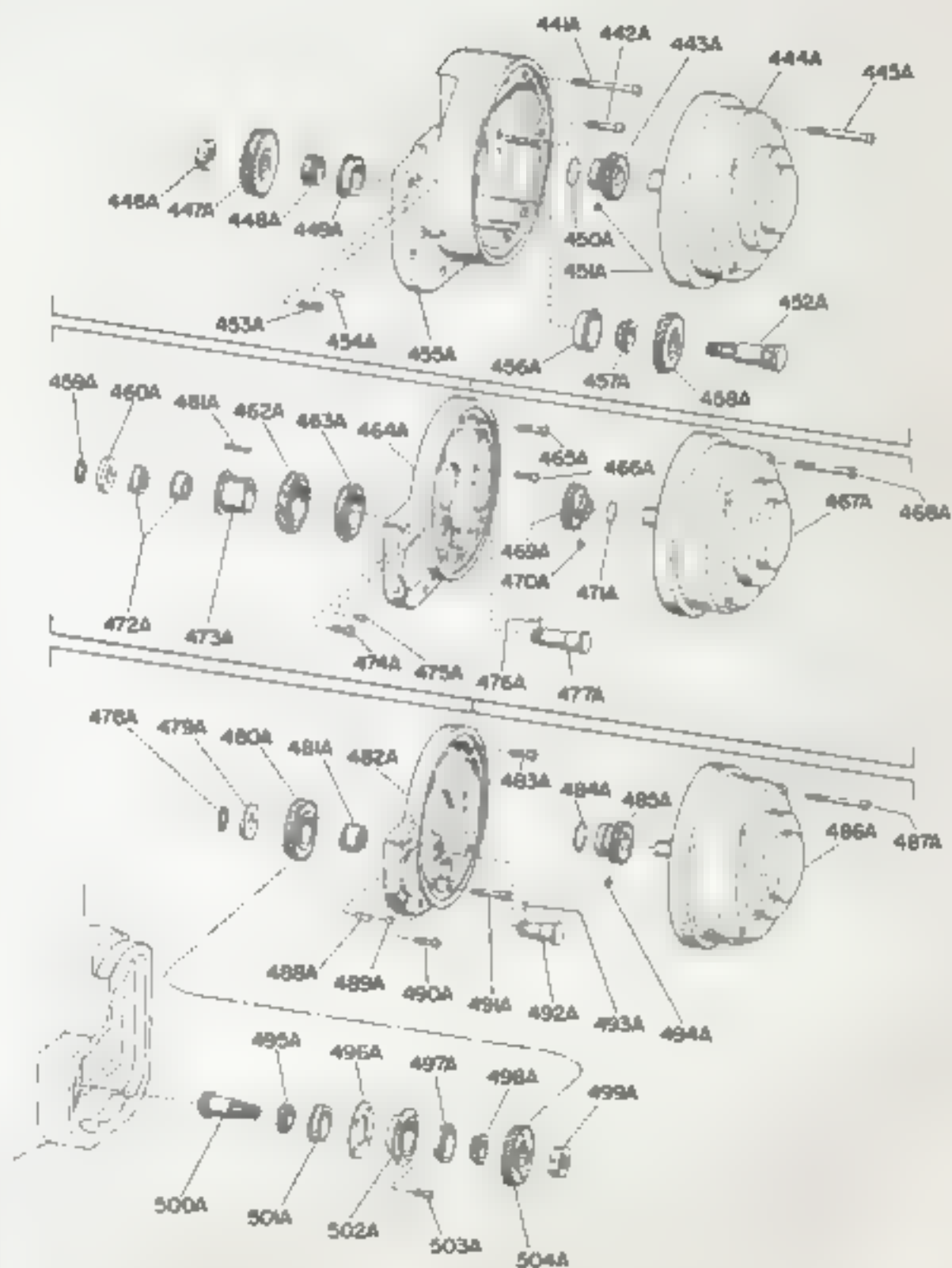
WHEN ORDERING PARTS, Give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 39, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL
2MI VERTICAL

Key No.	Part No.	Part Name	Am't. Used	Key No.	Part No.	Part Name	Am't. Used
2JK-286A	118332	Bushing - Spindle Shaft Guard	1	2JK-412A	118461	Roller - Bearing	14
	118331	2MI, 2ML Machines	1	2JK-412A	118461	Nut - Bearing Adjusting	1
2JK-287A	118335	Guard - Spindle Shaft	1		118461	2MI, 2ML Machines	1
	118334	2MI, 2ML Machines	1	2JK-413A	118461	2MI Machines	1
2JK-288A	118335	Guard - Shaft	1		118461	Gear - Elevating Clutch	1
	118334	2MI, 2ML Machines	1		118461	2MI, 2ML Machines	1
2JK-289A	118335	Guard - Shaft	1		118461	2MI Machines	1
	118334	2MI, 2ML Machines	1	2JK-414A	118461	Bushing - Pinion Shaft	1
2JK-290A	118335	Guard - Shaft	1	2JK-414A	118461	Cone - Bearing	1
	118334	2MI, 2ML Machines	1	2JK-414A	118461	Cap - Bearing	1
2JK-291A	118335	Guard - Shaft	1	2JK-414A	118461	Washer - Lock	1
	118334	2MI, 2ML Machines	1	2JK-414A	118461	Screw	1
2JK-292A	118335	Guard - Shaft	1		118461	Roll - Idle Spur Gear (2MI, 2ML)	1
	118334	2MI, 2ML Machines	1		118461	Machines With Rear Controls	1
2JK-293A	118335	Guard - Shaft	1	2JK-420A	118461	Gear - Idle Spur	1
	118334	2MI, 2ML Machines	1		118461	2MI, 2ML Machines With Rear Controls	1
2JK-294A	118335	Guard - Shaft	1		118461	2MI Machines With Rear Controls	1
	118334	2MI, 2ML Machines	1	2JK-421A	118461	Plug (2MI, 2ML Machines Without Rear	1
2JK-295A	118335	Guard - Shaft	1		118461	Controls)	1
	118334	2MI, 2ML Machines	1	2JK-422A	118461	Plug (2MI Machines Without Rear	1
2JK-296A	118335	Guard - Shaft	1		118461	Controls)	1
	118334	2MI, 2ML Machines	1	2JK-423A	118461	Screw - Gear Stud (2MI, 2ML Machines	1
2JK-297A	118335	Guard - Shaft	1		118461	With Rear Controls)	1
	118334	2MI, 2ML Machines	1	2JK-424A	118461	Pin - Straight - (2MI Machines With Rear	1
2JK-298A	118335	Guard - Shaft	1		118461	Controls)	1
	118334	2MI, 2ML Machines	1	2JK-425A	118461	Bushing - Wrench (With Rear Controls)	1
2JK-299A	118335	Guard - Shaft	1	2JK-426A	118461	Collar - Stud (With Rear Controls)	1
	118334	2MI, 2ML Machines	1	2JK-427A	118461	Screw - Set (With Rear Controls)	1
2JK-300A	118335	Guard - Shaft	1	2JK-428A	118461	Screw - Cap Stud (2MI Machines With	1
	118334	2MI, 2ML Machines	1		118461	Rear Controls)	1
2JK-301A	118335	Guard - Shaft	1	2JK-429A	118461	Roll - Idle Spur Gear (2MI Machines	1
	118334	2MI, 2ML Machines	1		118461	With Rear Controls)	1
2JK-302A	118335	Guard - Shaft	1	2JK-430A	118461	Plug (Without Rear Controls)	1
	118334	2MI, 2ML Machines	1	2JK-431A	118461	Washer - Idle Stud (2MI Machines With	1
2JK-303A	118335	Guard - Shaft	1		118461	Rear Controls)	1
	118334	2MI, 2ML Machines	1	2JK-432A	118461	Stud - Idle Stud (2MI Machines With	1
2JK-304A	118335	Guard - Shaft	1		118461	Controls)	1
	118334	2MI, 2ML Machines	1	2JK-433A	118461	Key - Square (With Rear Controls)	1
2JK-305A	118335	Guard - Shaft	1	2JK-434A	118461	Gear - Idle (With Rear Controls)	1
	118334	2MI, 2ML Machines	1	2JK-435A	118461	Screw - Set (With Rear Controls)	1
2JK-306A	118335	Guard - Shaft	1	2JK-436A	118461	Screw (With Rear Controls)	1
	118334	2MI, 2ML Machines	1	2JK-437A	118461	Washer - Lock (With Rear Controls)	1
2JK-307A	118335	Guard - Shaft	1	2JK-438A	118461	Gear - Spur	1
	118334	2MI, 2ML Machines	1		118461	2MI, 2ML Machines With Rear Controls	1
2JK-308A	118335	Guard - Shaft	1		118461	2MI Machines With Rear Controls	1
	118334	2MI, 2ML Machines	1	2JK-439A	118461	Bushing - Wrench (With Rear Controls)	1
2JK-309A	118335	Guard - Shaft	1	2JK-440A	118461	Collar - Stud (With Rear Controls)	1
	118334	2MI, 2ML Machines	1				

MOTOR DRIVE



CINCINNATI NOS 2 ML 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 39. How to Order Repair Parts.

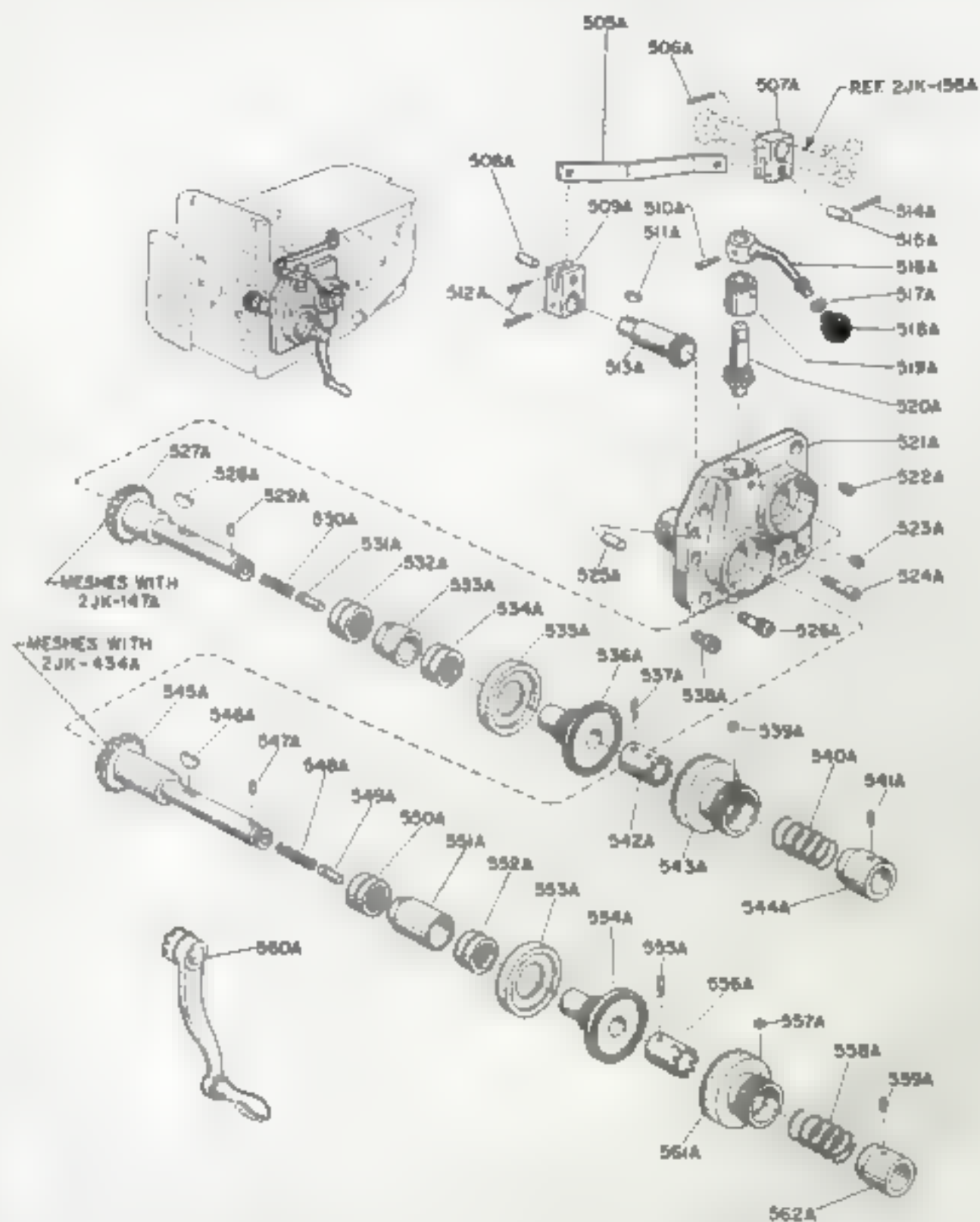
KNEE—UNIT No. 2JK (Continued)

MACHINES AS INDICATED BELOW

Key No.	Part No.	Part Name	Am. Used	Key No.	Part No.	Part Name	Am. Used
2MI - 1500 RPM				2JK-400A			
2JK-411A	2214	Screw	3	41144	Gear - Main		
2JK-412A	2208	Screw	3	41145	2MI, 2ML Machines		
2JK-413A	182781	Pinion - Motor Drive Gear	3	41146	2MI Machines		
2JK-414A	Example*	Motor - Drive	3	2JK-411A	Bearing - Needle		
2JK-415A	Example*	Screw - Motor	3	21717	2MI, 2ML Machines		
2JK-416A	5121	Nut - Lock	1	168526	2MI Machines		
2JK-417A	182784	Gear - Helical Drive	1	2JK-411A	Plate - Adapter		
2JK-418A	75187	Cou - Bearing	1	151117	2MI, 2ML, Plain and Universal Machines		
2JK-419A	168003	Cou - Bearing	1	155070	2MI Vertical Machines		
2JK-420A	94187	Ring - Retainer	1	197357	2MI Machines		
2JK-421A	5133	Set - Set	1	2JK-422A	2400	Slide	
2JK-423A	182780	Head - Motor Drive Gear	1	2JK-424A	Ring - Retainer		
2JK-424A	2400	Screw	3	40188	2MI, 2ML Machines		
2JK-425A	1884	Pin	3	40187	2MI Machines		
2JK-426A	145323	Plate - Adapter	1	2JK-424A	Pin - Motor Drive Retainer		
2JK-427A	104084	Cou - Bearing	1	151113	2MI, 2ML Machines		
2JK-428A	75187	Cou - Bearing	1	150780	2MI Machines		
2JK-429A	182780	Gear - Helical	3	2JK-428A	Example*	Motor - Drive	
				2JK-429A	Example*	Key - Motor	
				2JK-430A	1454	Pin	
2MI, 2ML PLAIN AND UNIVERSAL					1884	Pin and Universal Machines	
2MI VERTICAL WITHOUT POWER FEED TO VERTICAL HEAD					1884	Vertical Machines	
1500 RPM				2JK-430A	2400	Pin Vertical Machines Only	
2JK-431A	217471	Ring - Retainer	1	2JK-430A	2400	Screw	
2JK-432A	151848	Washer - Motor Head	1		2400	Pin and Universal Machines	
2JK-433A	1467	Key	1		2400	Vertical Machines	
2JK-434A	146417	Gear - Helical Drive	1	2JK-431A	2400	Screw (Vertical Machines Only)	
2JK-435A	146417	Gear - Helical - Drive	1	2JK-432A	2400	Slide - Motor Drive Retainer	
2JK-436A	146417	Motor - Adapter	1		43143	2MI, 2ML Machines	
2JK-437A	2400	Screw	1		557333	2MI Machines	
2JK-438A	1237	Screw	1	2JK-434A	2400	Pin	
2JK-439A	Example*	Motor - Drive	1	2JK-435A	2400	Key	
2JK-440A	Example*	Screw - Motor	1	2JK-436A	2400	Cou - Bearing	
2JK-441A	146417	Pin - Motor Drive Retainer	1		55144	Motor - Universal Retainer	
2JK-442A	2400	Screw	1		557334	2MI, 2ML Machines	
2JK-443A	2400	Screw	1		557335	2MI Machines	
2JK-444A	2400	Screw	1	2JK-437A	2400	Cou - Bearing	
2JK-445A	2400	Screw	1	2JK-438A	2400	Cou - Bearing	
2JK-446A	2400	Screw	1	2JK-439A	2400	Key - Lock	
2JK-447A	2400	Screw	1	2JK-440A	2400	Pin - Retainer	
2JK-448A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-449A	2400	Screw	1		146417	2MI Machines	
2JK-450A	2400	Screw	1	2JK-450A	2400	Cou - Bearing	
2JK-451A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-452A	2400	Screw	1		146417	2MI Machines	
2JK-453A	2400	Screw	1	2JK-451A	2400	Cou - Bearing	
2JK-454A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-455A	2400	Screw	1		146417	2MI Machines	
2JK-456A	2400	Screw	1	2JK-452A	2400	Cou - Bearing	
2JK-457A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-458A	2400	Screw	1		146417	2MI Machines	
2JK-459A	2400	Screw	1	2JK-453A	2400	Cou - Bearing	
2JK-460A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-461A	2400	Screw	1		146417	2MI Machines	
2JK-462A	2400	Screw	1	2JK-454A	2400	Cou - Bearing	
2JK-463A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-464A	2400	Screw	1		146417	2MI Machines	
2JK-465A	2400	Screw	1	2JK-455A	2400	Cou - Bearing	
2JK-466A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-467A	2400	Screw	1		146417	2MI Machines	
2JK-468A	2400	Screw	1	2JK-456A	2400	Cou - Bearing	
2JK-469A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-470A	2400	Screw	1		146417	2MI Machines	
2JK-471A	2400	Screw	1	2JK-457A	2400	Cou - Bearing	
2JK-472A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-473A	2400	Screw	1		146417	2MI Machines	
2JK-474A	2400	Screw	1	2JK-458A	2400	Cou - Bearing	
2JK-475A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-476A	2400	Screw	1		146417	2MI Machines	
2JK-477A	2400	Screw	1	2JK-459A	2400	Cou - Bearing	
2JK-478A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-479A	2400	Screw	1		146417	2MI Machines	
2JK-480A	2400	Screw	1	2JK-460A	2400	Cou - Bearing	
2JK-481A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-482A	2400	Screw	1		146417	2MI Machines	
2JK-483A	2400	Screw	1	2JK-461A	2400	Cou - Bearing	
2JK-484A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-485A	2400	Screw	1		146417	2MI Machines	
2JK-486A	2400	Screw	1	2JK-462A	2400	Cou - Bearing	
2JK-487A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-488A	2400	Screw	1		146417	2MI Machines	
2JK-489A	2400	Screw	1	2JK-463A	2400	Cou - Bearing	
2JK-490A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-491A	2400	Screw	1		146417	2MI Machines	
2JK-492A	2400	Screw	1	2JK-464A	2400	Cou - Bearing	
2JK-493A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-494A	2400	Screw	1		146417	2MI Machines	
2JK-495A	2400	Screw	1	2JK-465A	2400	Cou - Bearing	
2JK-496A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-497A	2400	Screw	1		146417	2MI Machines	
2JK-498A	2400	Screw	1	2JK-466A	2400	Cou - Bearing	
2JK-499A	2400	Screw	1		151464	2MI, 2ML Machines	
2JK-500A	2400	Screw	1		146417	2MI Machines	

*Give serial number of machine when ordering this part.

REAR CONTROL BRACKET



CINCINNATI NOS 2 ML, 2 ML AND 3 MI MILLING MACHINES

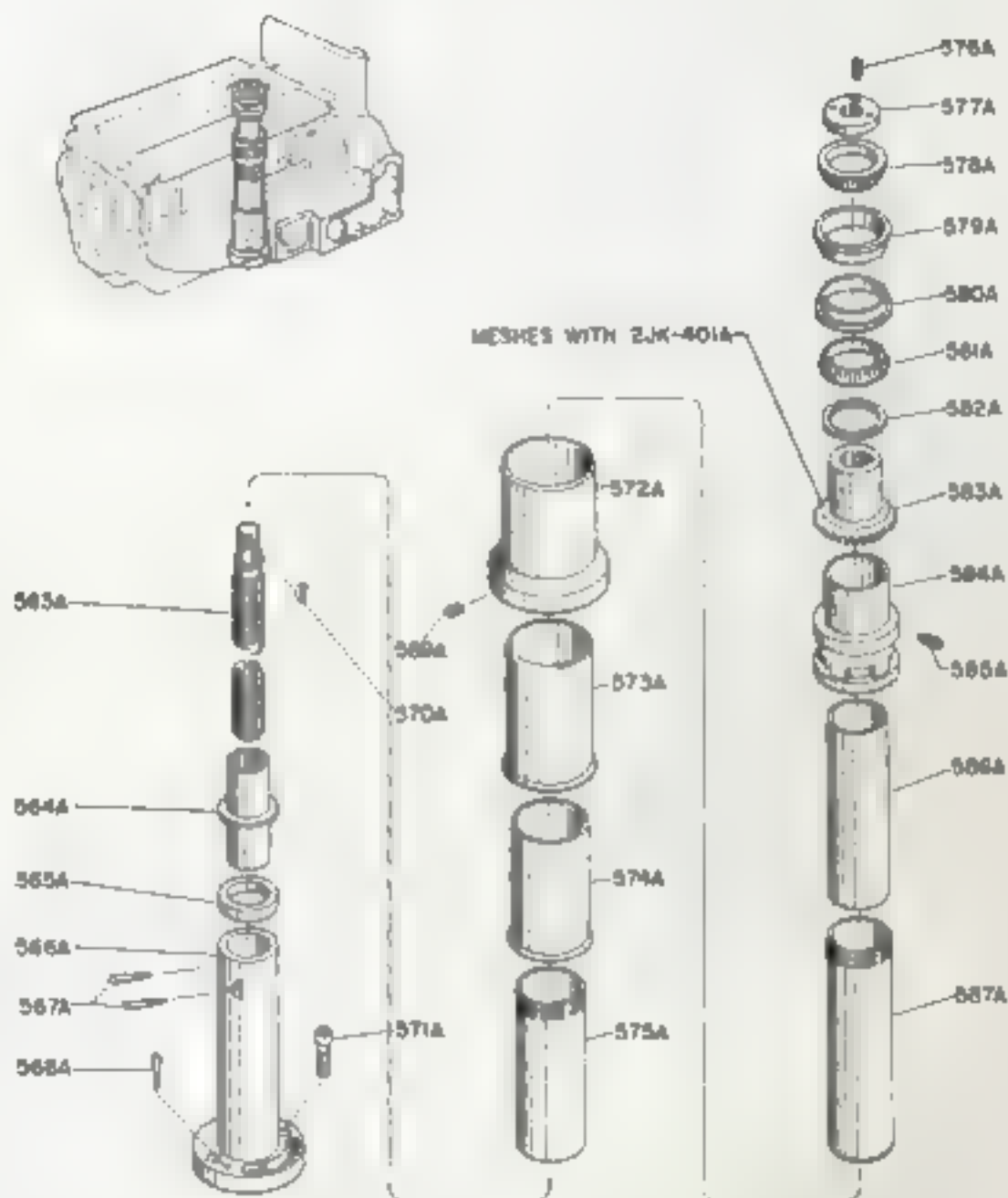
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

KNEE — UNIT No. 2JK (Continued)

2MI, 2ML AND 3MI PLAIN AND UNIVERSAL WITH REAR CONTROL
2MI VERTICAL

Key No.	Part No.	Part Name	Am. Used	Key No.	Part No.	Part Name	Am. Used
2JK-515A		Link - Rear Cross		2JK-531A	113471	Spring - Rear Clamping Control	1
	111382	2MI, 2ML Plain and Universal Machines	1	2JK-531A	113481	Bushing - Head	1
	111404	2MI Vertical Machines	1	2JK-531A	113491	Washer - Oil	1
	113407	2MI Machines	1	2JK-531A	113501	Clutch - Rear Clamping Dial	1
2JK-516A	1001	Pin - Guide	1	2JK-531A	113511	Pin - Taper	1
2JK-517A	111741	Link - Rear Cross - Short	1	2JK-531A	113521	Spring	1
2JK-518A	111751	Pin - Rear Cross	1	2JK-531A	113531	Spring	1
2JK-519A	111761	Link - Rear Cross	1	2JK-531A	113541	Spring	1
2JK-520A	1002	Pin - Taper	1	2JK-531A	113551	Spring	1
2JK-521A	1003	Key	1	2JK-531A	113561	Spring	1
2JK-522A	1004	Pin - Guide	1	2JK-531A	113571	Spring	1
2JK-523A	111771	Shall - Rear Cross	1	2JK-531A	113581	Spring	1
2JK-524A	1005	Pin - Collar	1	2JK-531A	113591	Spring	1
2JK-525A	111781	Pin - Rear Cross	1	2JK-531A	113601	Spring	1
2JK-526A	111791	Link - Rear Cross	1	2JK-531A	113611	Spring	1
2JK-527A	111801	Link - Rear Cross	1	2JK-531A	113621	Spring	1
2JK-528A	111811	Link - Rear Cross	1	2JK-531A	113631	Spring	1
2JK-529A	111821	Link - Rear Cross	1	2JK-531A	113641	Spring	1
2JK-530A	111831	Link - Rear Cross	1	2JK-531A	113651	Spring	1
2JK-531A	111841	Link - Rear Cross	1	2JK-531A	113661	Spring	1
2JK-532A	111851	Link - Rear Cross	1	2JK-531A	113671	Spring	1
2JK-533A	111861	Link - Rear Cross	1	2JK-531A	113681	Spring	1
2JK-534A	111871	Link - Rear Cross	1	2JK-531A	113691	Spring	1
2JK-535A	111881	Link - Rear Cross	1	2JK-531A	113701	Spring	1
2JK-536A	111891	Link - Rear Cross	1	2JK-531A	113711	Spring	1
2JK-537A	111901	Link - Rear Cross	1	2JK-531A	113721	Spring	1
2JK-538A	111911	Link - Rear Cross	1	2JK-531A	113731	Spring	1
2JK-539A	111921	Link - Rear Cross	1	2JK-531A	113741	Spring	1
2JK-540A	111931	Link - Rear Cross	1	2JK-531A	113751	Spring	1
2JK-541A	111941	Link - Rear Cross	1	2JK-531A	113761	Spring	1
2JK-542A	111951	Link - Rear Cross	1	2JK-531A	113771	Spring	1
2JK-543A	111961	Link - Rear Cross	1	2JK-531A	113781	Spring	1
2JK-544A	111971	Link - Rear Cross	1	2JK-531A	113791	Spring	1
2JK-545A	111981	Link - Rear Cross	1	2JK-531A	113801	Spring	1
2JK-546A	111991	Link - Rear Cross	1	2JK-531A	113811	Spring	1
2JK-547A	112001	Link - Rear Cross	1	2JK-531A	113821	Spring	1
2JK-548A	112011	Link - Rear Cross	1	2JK-531A	113831	Spring	1
2JK-549A	112021	Link - Rear Cross	1	2JK-531A	113841	Spring	1
2JK-550A	112031	Link - Rear Cross	1	2JK-531A	113851	Spring	1
2JK-551A	112041	Link - Rear Cross	1	2JK-531A	113861	Spring	1
2JK-552A	112051	Link - Rear Cross	1	2JK-531A	113871	Spring	1
2JK-553A	112061	Link - Rear Cross	1	2JK-531A	113881	Spring	1
2JK-554A	112071	Link - Rear Cross	1	2JK-531A	113891	Spring	1
2JK-555A	112081	Link - Rear Cross	1	2JK-531A	113901	Spring	1
2JK-556A	112091	Link - Rear Cross	1	2JK-531A	113911	Spring	1
2JK-557A	112101	Link - Rear Cross	1	2JK-531A	113921	Spring	1
2JK-558A	112111	Link - Rear Cross	1	2JK-531A	113931	Spring	1
2JK-559A	112121	Link - Rear Cross	1	2JK-531A	113941	Spring	1
2JK-560A	112131	Link - Rear Cross	1	2JK-531A	113951	Spring	1
2JK-561A	112141	Link - Rear Cross	1	2JK-531A	113961	Spring	1
2JK-562A	112151	Link - Rear Cross	1	2JK-531A	113971	Spring	1
2JK-563A	112161	Link - Rear Cross	1	2JK-531A	113981	Spring	1
2JK-564A	112171	Link - Rear Cross	1	2JK-531A	113991	Spring	1
2JK-565A	112181	Link - Rear Cross	1	2JK-531A	114001	Spring	1
2JK-566A	112191	Link - Rear Cross	1	2JK-531A	114011	Spring	1
2JK-567A	112201	Link - Rear Cross	1	2JK-531A	114021	Spring	1
2JK-568A	112211	Link - Rear Cross	1	2JK-531A	114031	Spring	1
2JK-569A	112221	Link - Rear Cross	1	2JK-531A	114041	Spring	1
2JK-570A	112231	Link - Rear Cross	1	2JK-531A	114051	Spring	1
2JK-571A	112241	Link - Rear Cross	1	2JK-531A	114061	Spring	1
2JK-572A	112251	Link - Rear Cross	1	2JK-531A	114071	Spring	1
2JK-573A	112261	Link - Rear Cross	1	2JK-531A	114081	Spring	1
2JK-574A	112271	Link - Rear Cross	1	2JK-531A	114091	Spring	1
2JK-575A	112281	Link - Rear Cross	1	2JK-531A	114101	Spring	1
2JK-576A	112291	Link - Rear Cross	1	2JK-531A	114111	Spring	1
2JK-577A	112301	Link - Rear Cross	1	2JK-531A	114121	Spring	1
2JK-578A	112311	Link - Rear Cross	1	2JK-531A	114131	Spring	1
2JK-579A	112321	Link - Rear Cross	1	2JK-531A	114141	Spring	1
2JK-580A	112331	Link - Rear Cross	1	2JK-531A	114151	Spring	1
2JK-581A	112341	Link - Rear Cross	1	2JK-531A	114161	Spring	1
2JK-582A	112351	Link - Rear Cross	1	2JK-531A	114171	Spring	1
2JK-583A	112361	Link - Rear Cross	1	2JK-531A	114181	Spring	1
2JK-584A	112371	Link - Rear Cross	1	2JK-531A	114191	Spring	1
2JK-585A	112381	Link - Rear Cross	1	2JK-531A	114201	Spring	1
2JK-586A	112391	Link - Rear Cross	1	2JK-531A	114211	Spring	1
2JK-587A	112401	Link - Rear Cross	1	2JK-531A	114221	Spring	1
2JK-588A	112411	Link - Rear Cross	1	2JK-531A	114231	Spring	1
2JK-589A	112421	Link - Rear Cross	1	2JK-531A	114241	Spring	1
2JK-590A	112431	Link - Rear Cross	1	2JK-531A	114251	Spring	1
2JK-591A	112441	Link - Rear Cross	1	2JK-531A	114261	Spring	1
2JK-592A	112451	Link - Rear Cross	1	2JK-531A	114271	Spring	1
2JK-593A	112461	Link - Rear Cross	1	2JK-531A	114281	Spring	1
2JK-594A	112471	Link - Rear Cross	1	2JK-531A	114291	Spring	1
2JK-595A	112481	Link - Rear Cross	1	2JK-531A	114301	Spring	1
2JK-596A	112491	Link - Rear Cross	1	2JK-531A	114311	Spring	1
2JK-597A	112501	Link - Rear Cross	1	2JK-531A	114321	Spring	1
2JK-598A	112511	Link - Rear Cross	1	2JK-531A	114331	Spring	1
2JK-599A	112521	Link - Rear Cross	1	2JK-531A	114341	Spring	1
2JK-600A	112531	Link - Rear Cross	1	2JK-531A	114351	Spring	1

ELEVATING SCREW



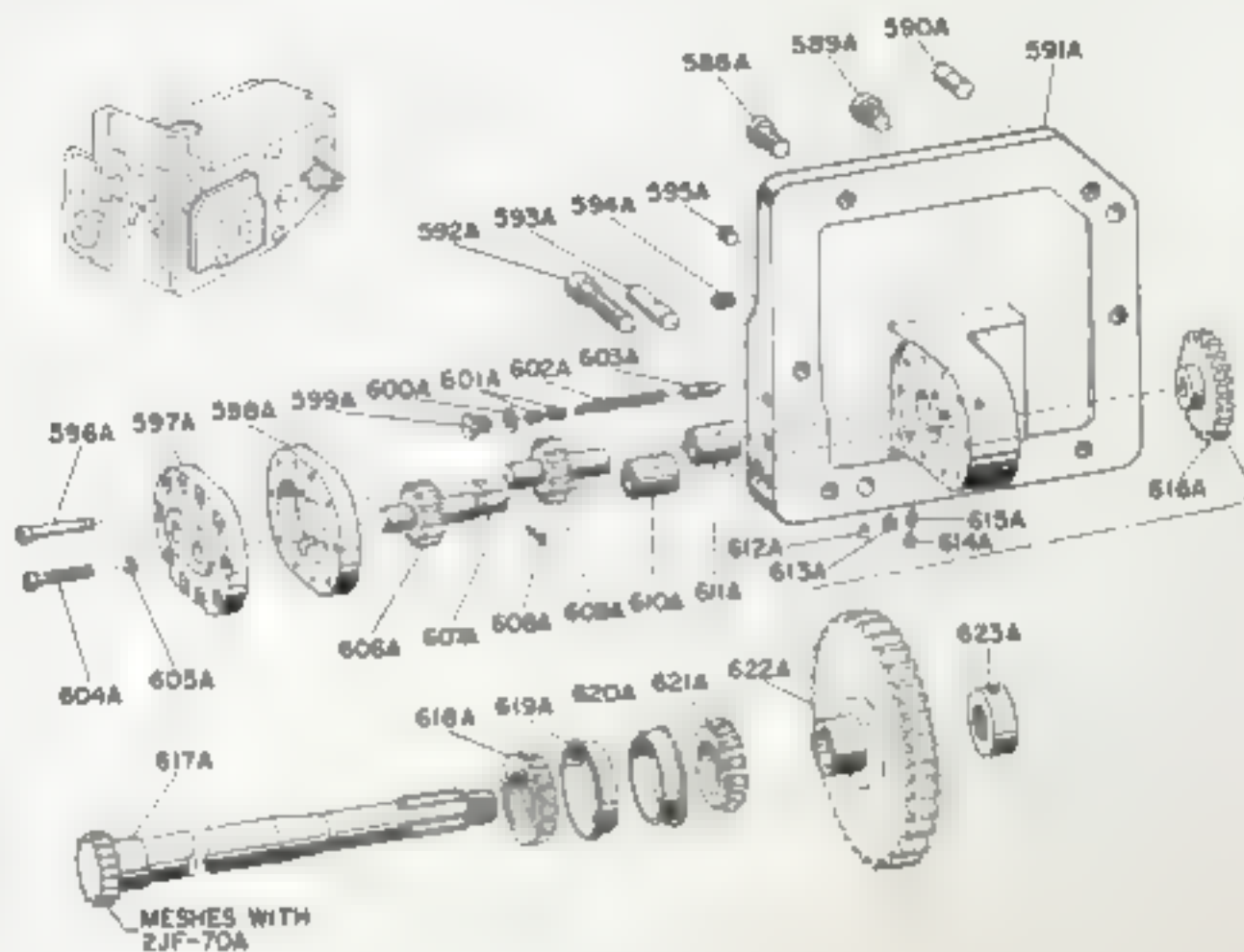
CINCINNATI NOS 2 ML 2 AND 3 ML MILLING MACHINE

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

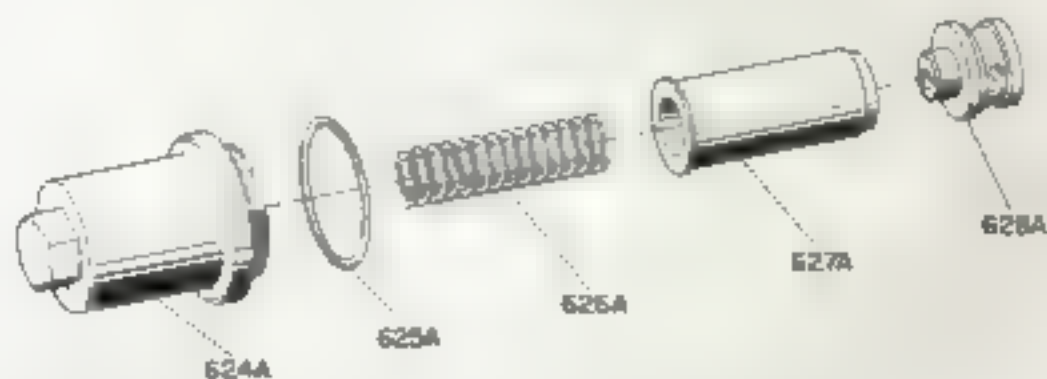
KNEE — UNIT No. 2JK (Continued)

2MM, 2MM AND 3MM PLAIN AND UNIVERSAL
2MM VERTICAL[illegible]

HYDRAULIC PUMP



SKINNER FILTER



主編 周興
副主編 凡丹
編審 何如
審校 何如

CINCINNATI NOS 2 ML 2 MI AND 3 MI MILLING MACHINES

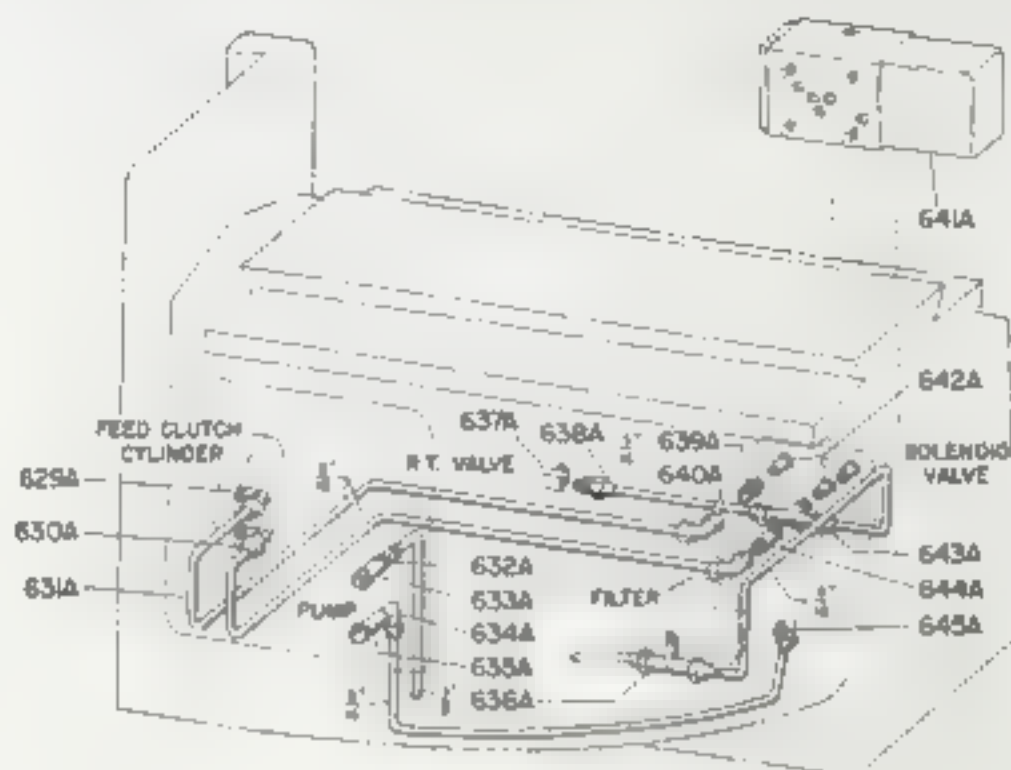
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 99 "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL
3MI VERTICAL

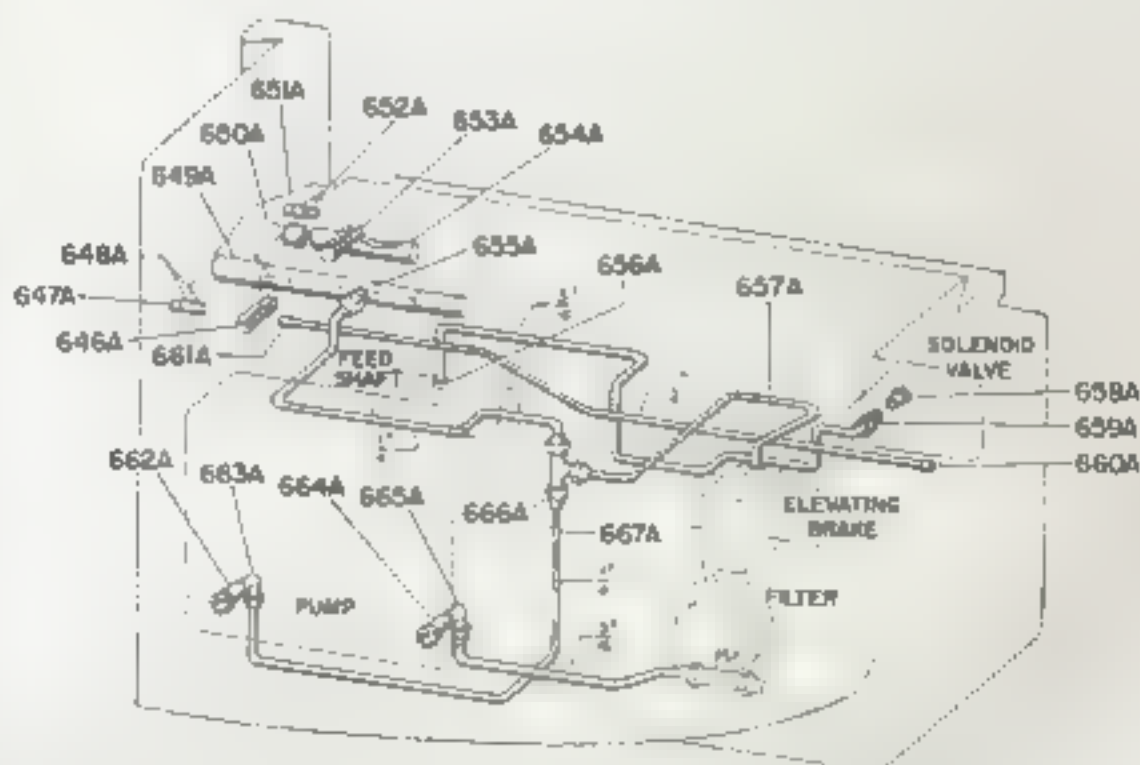
Key No.	Part No.	Part Name	QTY Each	Key No.	Part No.	Part Name	QTY Each
2JK-844A	6403	Screw	3	2JK-812A	4334	Plug - Pipe	1
2JK-844A	3319	Screw	1	2JK-814A	18444	Bracket - Set	3
2JK-844A	1424	Pin	1	2JK-815A	2337	Bracket - Set	3
2JK-844A	14482	Bracket - Pump To Motor Gear Connection	1	2JK-816A	14343	Gear - Pump Drive	1
2JK-844A	8162	Screw	2	2JK-817A		Gear - Feed Box Drive	1
2JK-844A	23314	Pin	1				
2JK-844A	7444	Plug - Pipe	3		15140	2MI, 3MI Machines - 1/4 - 30 Feed	1
2JK-844A	7444	Plug - Pipe	3		15141	2MI, 3MI, 4MI Machines - 1/3 - 40 Feed	1
2JK-844A	15744	Bracket - Body For	3		15857	3MI Machines - 1/4 - 30 Feed	1
2JK-844A	108214	Bracket - Pump - Sym.	1		15858	3MI Machines - 1/3 - 40 Feed	1
2JK-844A	15744	Bracket - Pump	1	2JK-818A	8554	Cone - Bearing	1
2JK-844A	4333	Screw	1	2JK-819A	8554	Cup - Bearing	1
2JK-844A	23444	Bracket	1	2JK-820A	8554	Cup - Bearing	1
2JK-844A	1811	Screw - Set	2	2JK-821A	8554	Cone - Bearing	1
2JK-844A	13823	Spring	3	2JK-822A		Gear - Drive Shaft	1
2JK-844A	48913	Valve - Relief	1		15180	2MI, 3MI Machines	1
2JK-844A	3118	Bracket	3		15401	3MI Machines	1
2JK-844A	8123	Washer - Lock	10	2JK-823A	4342	Pin - Lock	1
2JK-844A	15744	Bracket - Pump - Driver	1	2JK-824A	15741	Cone - Oil Filter	1
2JK-844A	3378	Key	1	2JK-825A	15741	Cone - Oil	1
2JK-844A	3444	Pin - Center	1	2JK-826A	15741	Spring - Oil Filter	1
2JK-844A	15741	Bracket - Pump - Driver	1	2JK-827A	15741	Element - Oil Filter	1
2JK-844A	14341	Bracket - Pump	1	2JK-828A		Plug - Oil Filter	1
2JK-844A	14342	Bracket - Pump	1		15157	2MI, 3MI Machines	1
2JK-844A	1844	Pin	2		15724	3MI Machines	1

HYDRAULIC TUBING



624 RR
674 RR

LUBRICATION TUBING



175 RR
435 RR

CINCINNATI NOS 2 ML 2 MI AND 3 MI MILING MACHINES

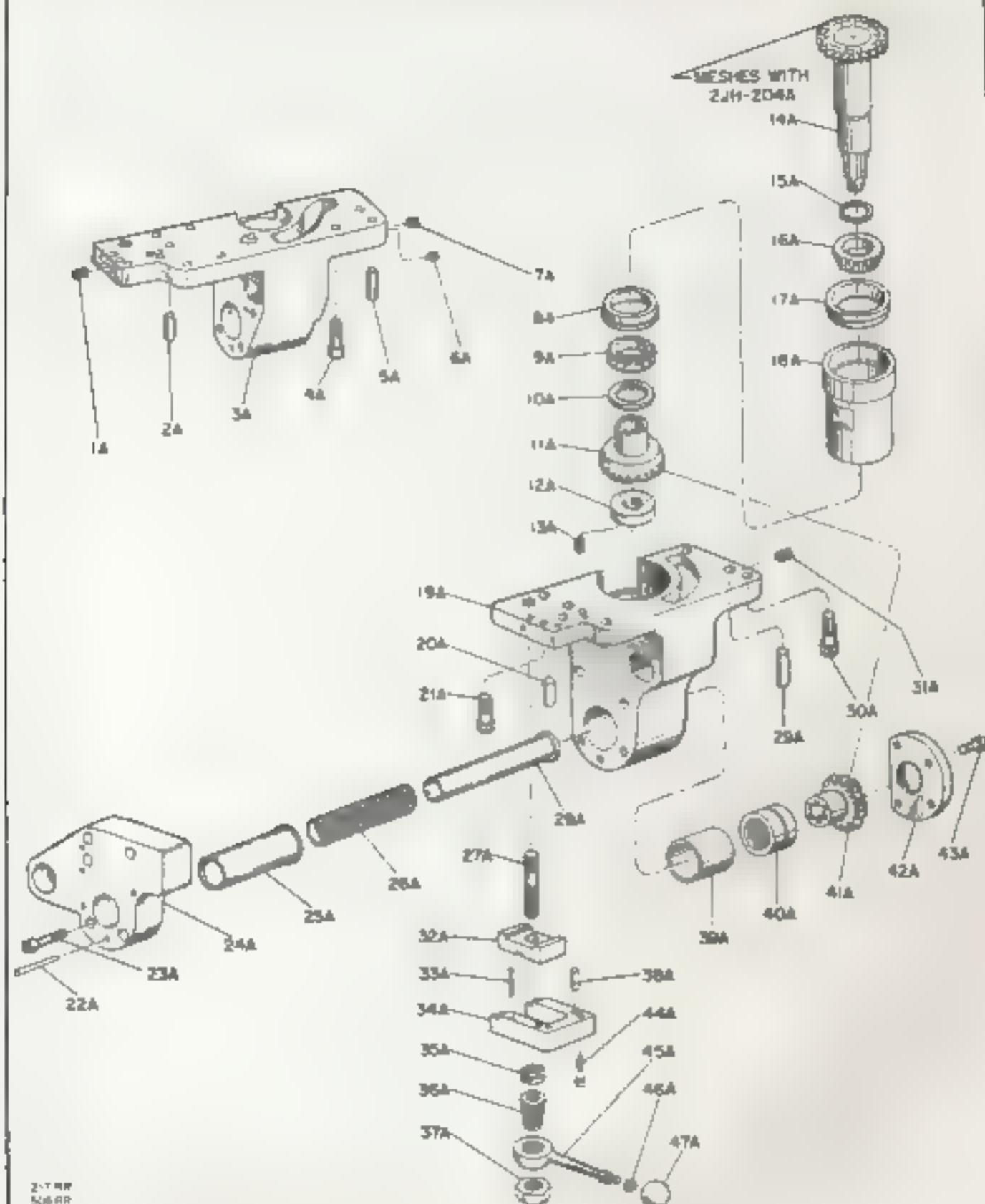
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

KNEE—UNIT No. 2JK (Concluded)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL
2MI VERTICAL

Key No.	Part No.	Part Name	Ami Lead	Key No.	Part No.	Part Name	Ami Lead
2JK-828A	4019	Pinning - Taping - Elbow	1	2JK-830A	3949	Plug	1
2JK-830A	4019	Pinning - Taping - Elbow	1	2JK-831A	71101	Plug - Distribution	1
2JK-831A		Tapping Last	1	2JK-832A	1836	Plug - Pin	1
	154473	2MI, 2ML, 2MI and Universal Machines	1	2JK-833A	113471	Trough - Oil	1
	154574	2MI Vertical Machine	1	2JK-834A	111786	Trough - Oil	1
	157413	3MI Machine	1	2JK-835A	63664	Pinning - Taping	1
2JK-832A	887170	Pinning - Taping	1	2JK-836A	3170	Brushing - Taping	1
2JK-833A	142585	Plug - Pin	1	2JK-837A		Plug - Pin	1
2JK-834A	4013	Pinning - Taping - Elbow	1		154544	2MI, 2ML, 2MI and Universal Machines	1
2JK-835A	142584	Plug - Pin	1		160591	2MI Vertical Machine	1
2JK-836A	114638	Pinning - Taping - Tee	1		117147	3MI Machine	1
2JK-837A	114645	Adapter - Elbow	1	2JK-838A	111783	Brushing	1
2JK-838A	70143	Pinning - Taping	1	2JK-839A	4014	Pinning - Taping	1
2JK-839A	88110	Adapter - Pin	1	2JK-840A	4780	Brushing - Taping	1
2JK-840A	118729	Pinning - Taping - Elbow	1	2JK-841A	4780	Brushing - Taping	1
2JK-841A	118728	Valve - Distributor	1	2JK-842A	142584	Plug - Pin	1
2JK-842A	111593	Brushing	1	2JK-843A	142584	Plug - Pin	1
2JK-843A	218748	Pinning - Taping - Tee	1	2JK-844A	142584	Plug - Pin	1
2JK-844A		Adapter - Pin	1	2JK-845A	4013	Pinning - Taping - Elbow	1
	104290	2MI, 2ML Machine	1	2JK-846A	63664	Pinning - Taping - Tee	1
	21843	3MI Machine	1	2JK-847A		Tapping Last	1
2JK-845A	4013	Pinning - Taping - Elbow	1		154573	2MI, 2ML, 2MI and Universal Machines	1
2JK-846A	111431	Trough - Oil	1		154574	2MI Vertical Machine	1
2JK-847A	74381	Plug - Distribution	1		157147	3MI Machine	1
2JK-848A	1938	Plug - Pin	1				
2JK-849A		Distributor - Oil	1				
	118057	2MI, 2ML Machine	1				
	113478	3MI Machine	1				

BRACKET UNDER SADDLE



2-TW
506-RR

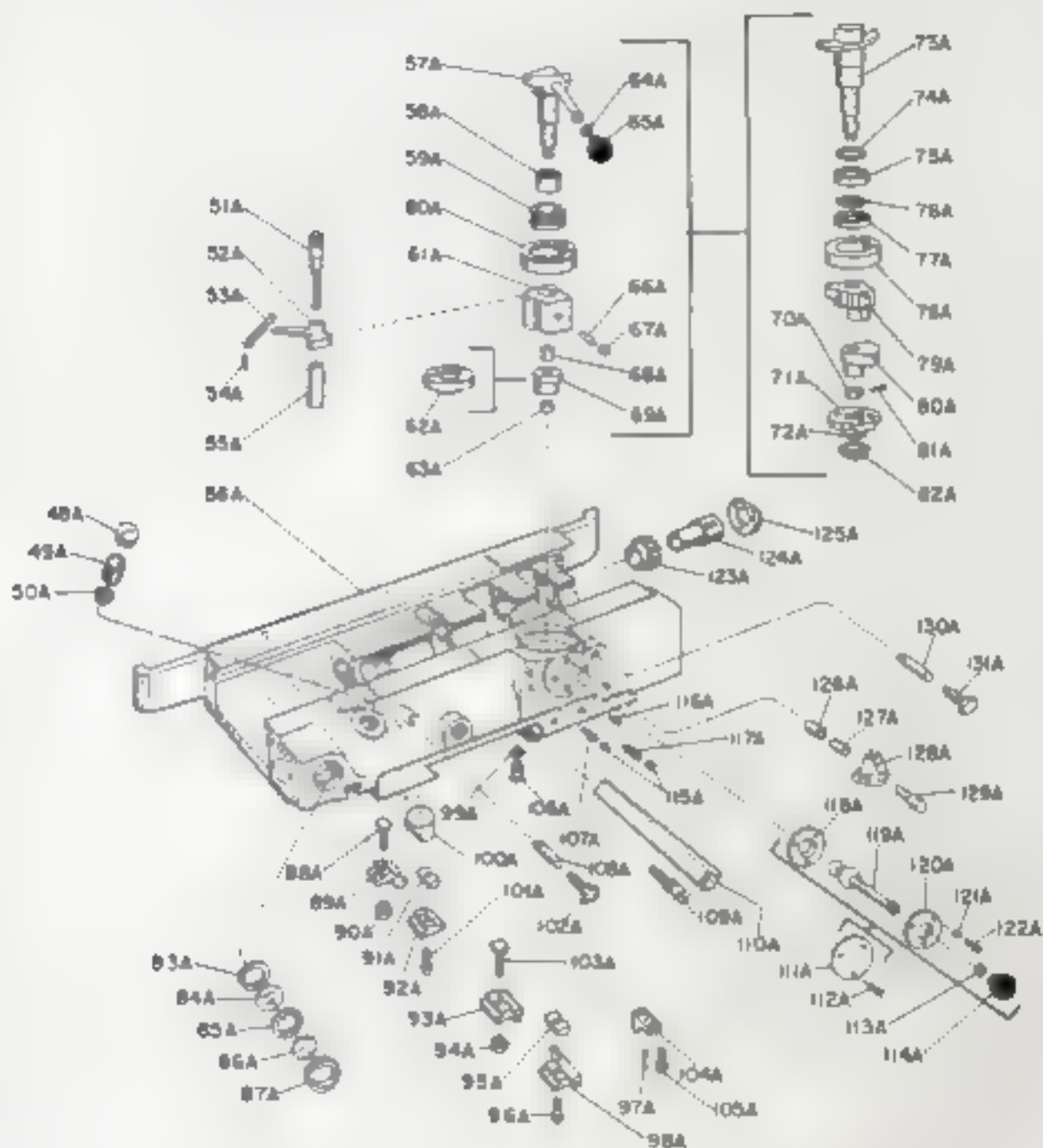
CINCINNATI NOS 3 ML & M AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, Give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 77, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH 3ML, 2MM AND 3MM PLAIN AND UNIVERSAL 2MM VERTICAL

Key No.	Part No.	Part Name	Unit Used	Key No.	Part No.	Part Name	Unit Used
2JH-1A	3311	Screw - Set (2MI Machines Only)	1	2JH-13A	194030	Bracket - Outer Saddle (2MI, 2ML, 2MM Machines Only)	1
2JH-2A	1428	Pin - Short (2MI Machines Only)	1	2JH-24A	1594	Pin - Short (2MI, 2ML, 2MM Machines Only)	1
2JH-3A	144018	Bracket - Under Saddle (2MI, 2ML, 2MM Machines Only)	1	2JH-25A	1461	Screw (2MI, 2ML, 2MM Machines Only)	2
2JH-4A	3404	Screw (2MI Machines Only)	1	2JH-26A	1387	Pin - Taper	1
2JH-5A	1638	Pin - Long (2MI Machines Only)	1	2JH-27A	1748	Screw	1
2JH-6A	3723	Screw - Set (2MI Machines Only)	1	2JH-28A	134677	Bracket - Cross Feed (2MI, 2ML, 2MM Machines Only)	1
2JH-7A	1817	Screw - Set (2MI Machines Only)	1	2JH-29A	134751	2MI, 2ML, 2MM Machines	1
2JH-8A	11030	Cup - Bearing	1	2JH-30A	178313	Cover - Spring Shaft	1
2JH-9A	104771	2MI, 2ML, 2MM Machines	1	2JH-31A	123463	2MI, 2ML, 2MM Machines	1
2JH-10A	84778	Cone - Bearing	1	2JH-32A	110237	Spring - Cover	1
2JH-11A	88148	2MI, 2ML, 2MM Machines	1	2JH-33A	134017	Roll - Clamping	1
2JH-12A	114446	Washer - Worm Shaft Gear	1	2JH-34A	144444	Extension - Spring Shaft Cover	1
2JH-13A	114081	2MI, 2ML, 2MM Machines	1	2JH-35A	189447	2MI, 2ML, 2MM Machines	1
2JH-14A	116487	Cone - Spring	1	2JH-36A	1439	Pin - Long (2MI, 2ML, 2MM Machines Only)	1
2JH-15A	104271	2MI, 2ML, 2MM Machines	1	2JH-37A	1343	Screw	1
2JH-16A	111318	Roll - Spring Gear	1	2JH-38A	1373	Screw - Set	1
2JH-17A	1768	Screw - Set	1	2JH-39A	144012	Clamp - Saddle	1
2JH-18A	141322	Gear - Worm Shaft	1	2JH-40A	1377	Pin	1
2JH-19A	115304	2MI, 2ML, 2MM Machines	1	2JH-41A	144018	Bearing - Clamp	1
2JH-20A	113450	2MI, 2ML, 2MM Machines	1	2JH-42A	144018	Clamp - Lower	1
2JH-21A	114131	2MI, 2ML, 2MM Machines	1	2JH-43A	144018	Roll - Clamping	1
2JH-22A	114041	Washer - Flange (2MI Machines Only)	1	2JH-44A	1381	Roll - Key	1
2JH-23A	84778	Cone - Bearing	1	2JH-45A	1444	Pin - Double Diameter	1
2JH-24A	84188	2MI, 2ML, 2MM Machines	1	2JH-46A	114013	Survey - Bracket	1
2JH-25A	11030	Cup - Bearing	1	2JH-47A	137618	Bearing - Saddle	1
2JH-26A	108171	2MI, 2ML, 2MM Machines	1	2JH-48A	115412	Cover - Bracket Outer Saddle	1
2JH-27A	108171	2MI, 2ML, 2MM Machines	1	2JH-49A	115413	2MI, 2ML, 2MM Machines	1
2JH-28A	141322	Washer - Worm Gear	1	2JH-50A	111337	Cover - Bracket	1
2JH-29A	114587	2MI, 2ML, 2MM Machines	1	2JH-51A	1390	Roll - Key	1
2JH-30A	134490	2MI, 2ML, 2MM Machines	1	2JH-52A	1397	Roll - Key	1
2JH-31A	134490	2MI, 2ML, 2MM Machines	1	2JH-53A	144014	Roll - Clamp	1
2JH-32A	134490	2MI, 2ML, 2MM Machines	1	2JH-54A	1131	Washer - Lock	1
2JH-33A	134490	2MI, 2ML, 2MM Machines	1	2JH-55A	115412	Roll - Saddle	1

SADDLE AND LINKAGE PLAIN AND VERTICAL MACHINES



210 RR
310 RR
321 RR
324 RR

CINCINNATI NO. 2 MILL UNIT 3 MILL MILLING MACHINES

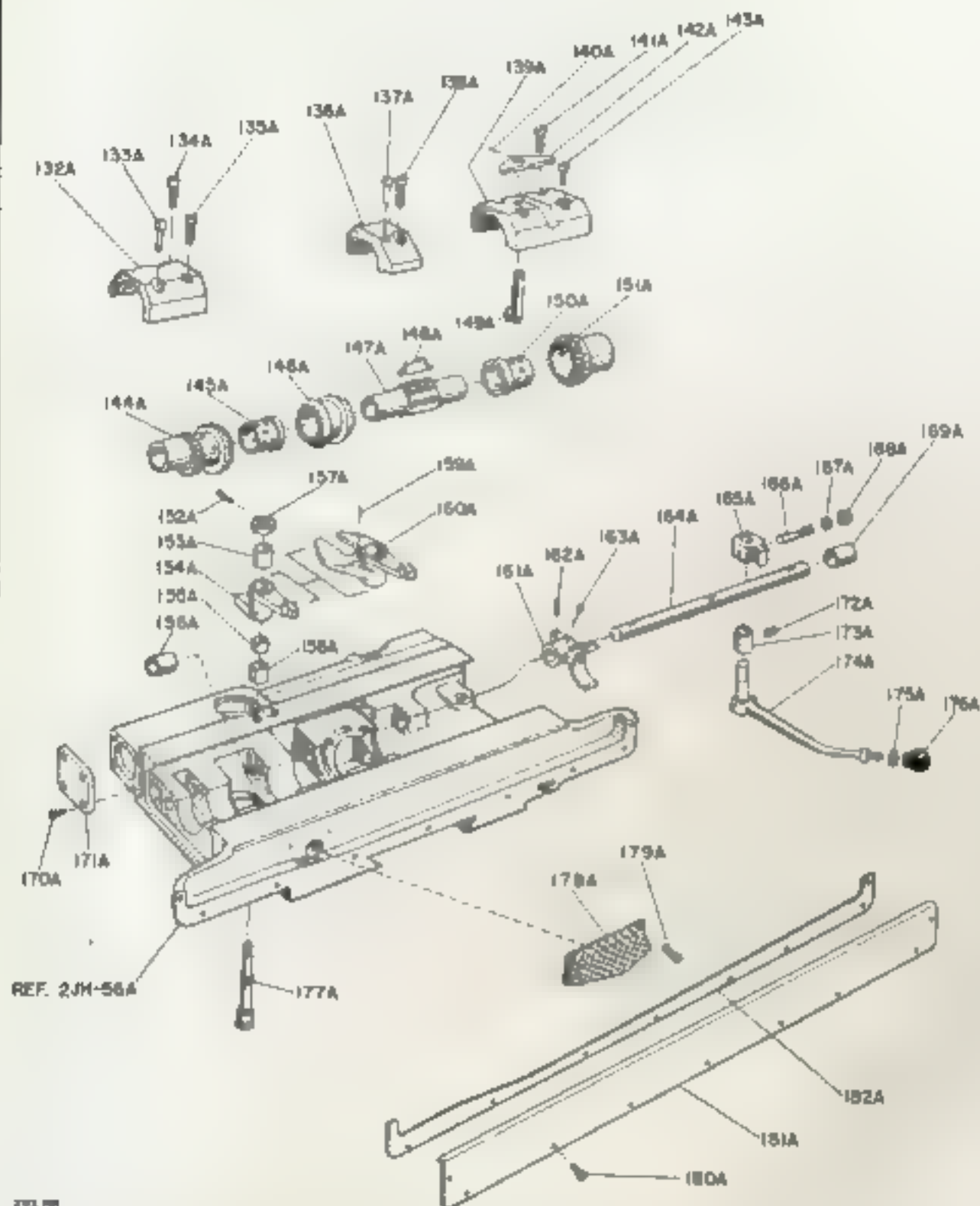
WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 33 "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2M (Continued)

PLAIN AND VERTICAL MACHINES

Key No.	Part No.	Part Name	Key No.	Part No.	Part Name
278-44A	2938	Cog - On Frame	278-45A	3043	Pin - On Cage
278-45A	2939	Spring - On Frame	278-46A	3044	Cover - On Cage
278-46A	114031	Frame - On Frame	278-47A	3230	Roll - Top (Plain Machine Only)
278-47A	141309	Roll - Bottom	278-48A	120434	Cog - Top (Plain Machine Only)
278-48A	241310	Roll - Bottom	278-49A	694	Roll - Top (Plain Machine Only)
278-49A	327893	Roll - Bottom	278-50A	125457	Roll - Bottom (Top)
278-50A	316378	Pin - Spring	278-51A	125535	Cog - Rolling Feed - Feed
278-51A	141309	Rolling - Crown Roller Bar	278-52A	132114	Cog - Rolling Feed - Feed
278-52A	141309	Rolling - Crown Roller Bar	278-53A	141	Roll - Roll
278-53A	141309	Rolling - Crown Roller Bar	278-54A	120457	Roll - Rolling Feed
278-54A	141309	Rolling - Crown Roller Bar	278-55A	3230	Pin - Single (2M Vertical Machine Only)
278-55A	141309	Rolling - Crown Roller Bar	278-56A	120457	Cog - Rolling Feed - Feed
278-56A	141309	Rolling - Crown Roller Bar	278-57A	120457	Roll - Rolling Feed - Feed
278-57A	141309	Rolling - Crown Roller Bar	278-58A	120457	Roll - Rolling Feed - Feed
278-58A	141309	Rolling - Crown Roller Bar	278-59A	120457	Roll - Rolling Feed - Feed
278-59A	141309	Rolling - Crown Roller Bar	278-60A	120457	Roll - Rolling Feed - Feed
278-60A	141309	Rolling - Crown Roller Bar	278-61A	120457	Roll - Rolling Feed - Feed
278-61A	141309	Rolling - Crown Roller Bar	278-62A	120457	Roll - Rolling Feed - Feed
278-62A	141309	Rolling - Crown Roller Bar	278-63A	120457	Roll - Rolling Feed - Feed
278-63A	141309	Rolling - Crown Roller Bar	278-64A	120457	Roll - Rolling Feed - Feed
278-64A	141309	Rolling - Crown Roller Bar	278-65A	120457	Roll - Rolling Feed - Feed
278-65A	141309	Rolling - Crown Roller Bar	278-66A	120457	Roll - Rolling Feed - Feed
278-66A	141309	Rolling - Crown Roller Bar	278-67A	120457	Roll - Rolling Feed - Feed
278-67A	141309	Rolling - Crown Roller Bar	278-68A	120457	Roll - Rolling Feed - Feed
278-68A	141309	Rolling - Crown Roller Bar	278-69A	120457	Roll - Rolling Feed - Feed
278-69A	141309	Rolling - Crown Roller Bar	278-70A	120457	Roll - Rolling Feed - Feed
278-70A	141309	Rolling - Crown Roller Bar	278-71A	120457	Roll - Rolling Feed - Feed
278-71A	141309	Rolling - Crown Roller Bar	278-72A	120457	Roll - Rolling Feed - Feed
278-72A	141309	Rolling - Crown Roller Bar	278-73A	120457	Roll - Rolling Feed - Feed
278-73A	141309	Rolling - Crown Roller Bar	278-74A	120457	Roll - Rolling Feed - Feed
278-74A	141309	Rolling - Crown Roller Bar	278-75A	120457	Roll - Rolling Feed - Feed
278-75A	141309	Rolling - Crown Roller Bar	278-76A	120457	Roll - Rolling Feed - Feed
278-76A	141309	Rolling - Crown Roller Bar	278-77A	120457	Roll - Rolling Feed - Feed
278-77A	141309	Rolling - Crown Roller Bar	278-78A	120457	Roll - Rolling Feed - Feed
278-78A	141309	Rolling - Crown Roller Bar	278-79A	120457	Roll - Rolling Feed - Feed
278-79A	141309	Rolling - Crown Roller Bar	278-80A	120457	Roll - Rolling Feed - Feed
278-80A	141309	Rolling - Crown Roller Bar	278-81A	120457	Roll - Rolling Feed - Feed
278-81A	141309	Rolling - Crown Roller Bar	278-82A	120457	Roll - Rolling Feed - Feed
278-82A	141309	Rolling - Crown Roller Bar	278-83A	120457	Roll - Rolling Feed - Feed
278-83A	141309	Rolling - Crown Roller Bar	278-84A	120457	Roll - Rolling Feed - Feed
278-84A	141309	Rolling - Crown Roller Bar	278-85A	120457	Roll - Rolling Feed - Feed
278-85A	141309	Rolling - Crown Roller Bar	278-86A	120457	Roll - Rolling Feed - Feed
278-86A	141309	Rolling - Crown Roller Bar	278-87A	120457	Roll - Rolling Feed - Feed
278-87A	141309	Rolling - Crown Roller Bar	278-88A	120457	Roll - Rolling Feed - Feed
278-88A	141309	Rolling - Crown Roller Bar	278-89A	120457	Roll - Rolling Feed - Feed
278-89A	141309	Rolling - Crown Roller Bar	278-90A	120457	Roll - Rolling Feed - Feed
278-90A	141309	Rolling - Crown Roller Bar	278-91A	120457	Roll - Rolling Feed - Feed
278-91A	141309	Rolling - Crown Roller Bar	278-92A	120457	Roll - Rolling Feed - Feed
278-92A	141309	Rolling - Crown Roller Bar	278-93A	120457	Roll - Rolling Feed - Feed
278-93A	141309	Rolling - Crown Roller Bar	278-94A	120457	Roll - Rolling Feed - Feed
278-94A	141309	Rolling - Crown Roller Bar	278-95A	120457	Roll - Rolling Feed - Feed
278-95A	141309	Rolling - Crown Roller Bar	278-96A	120457	Roll - Rolling Feed - Feed
278-96A	141309	Rolling - Crown Roller Bar	278-97A	120457	Roll - Rolling Feed - Feed
278-97A	141309	Rolling - Crown Roller Bar	278-98A	120457	Roll - Rolling Feed - Feed
278-98A	141309	Rolling - Crown Roller Bar	278-99A	120457	Roll - Rolling Feed - Feed
278-99A	141309	Rolling - Crown Roller Bar	278-100A	120457	Roll - Rolling Feed - Feed

LEADSCREW CLUTCH



273 MM
510 RP
515 RP

CINCINNATI NOS 2 ML 2 MJ AND 3 MJ MILLING MACHINES

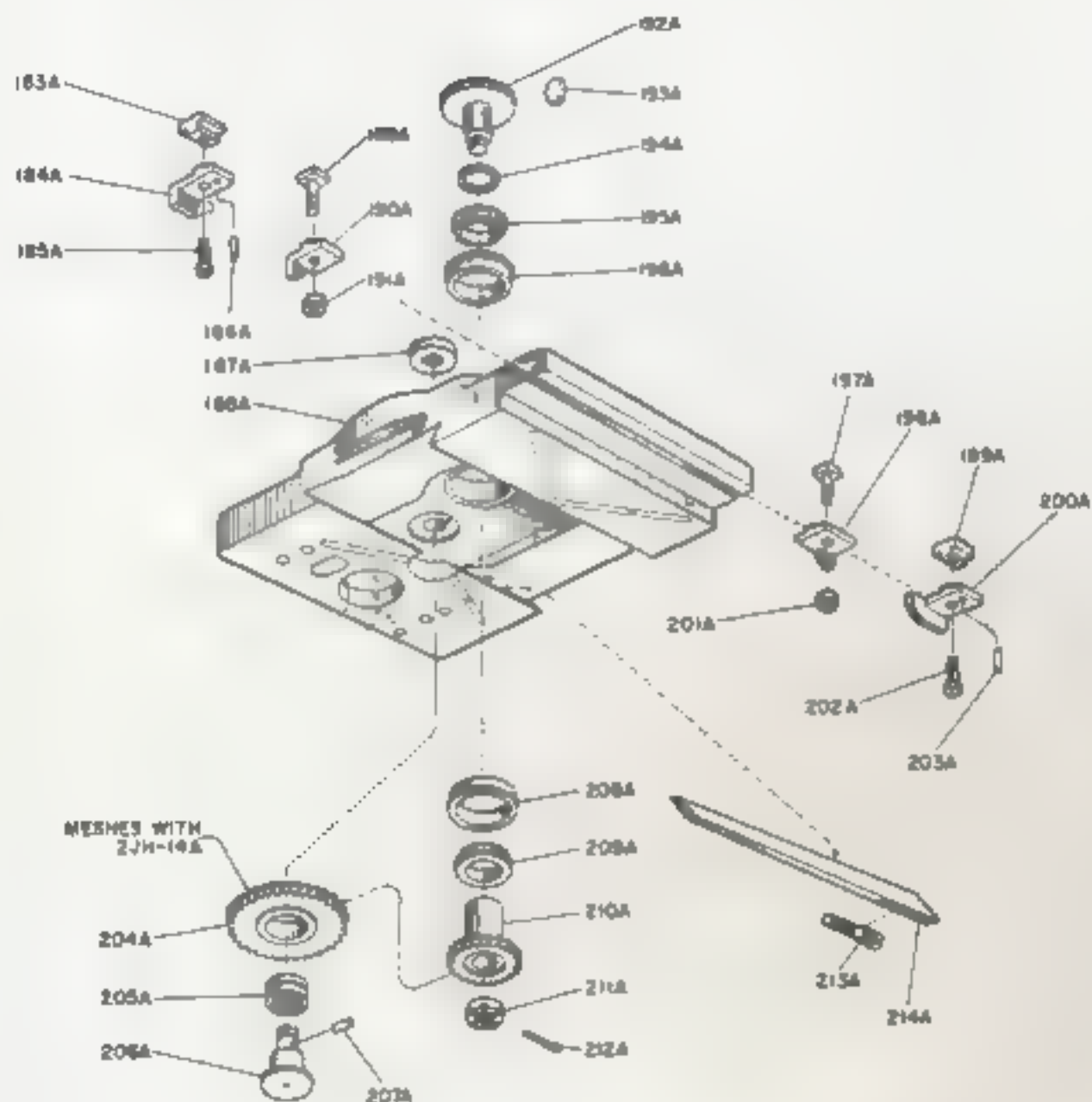
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JM (Continued)

PLAIN AND VERTICAL MACHINES

Key No.	Part No.	Part Name	Unit Code	Key No.	Part No.	Part Name	Unit Code
2JM-131A	14471	Cap - Bearing - Right		216-131A	3490	Pin - Corner	1
	14472	IML, IML Machines	1	216-131A	3497A	Bearing - Needle	1
	14473	IML Machine	1	216-131A		Part - Trip Lever	
2JM-132A		Pin - Taper			143423	IML, IML Machines Without Auto Table Cycle	
	14474	IML, IML Machines	1			Cycle	1
	14475	IML Machine	1		143421	IML Machines Without Auto Table Cycle	1
2JM-134A	14476	Pin - Taper	1	216-131A	341311	Spacer - Bearing	1
2JM-131A	14477	IML, IML Machines	1	216-131A	341311	Spacer	1
	14478	IML Machine	1	216-131A	341311	Pin - Lock	1
	14479	IML Machine	1	216-131A	341311	Bearing - Needle	1
2JM-134A	14480	Cap - Bearing - Middle		216-131A	341311	Pin - Auto Table Cycle	1
	14481	IML, IML Machines	1	216-131A	341311	Part - Cycle Shift	
	14482	IML Machine	1			IML, IML Machines With Auto Table Cycle	1
2JM-131A	14483	Pin - Taper	1		143420	IML Machines With Auto Table Cycle	1
2JM-134A	14484	IML, IML Machines	1	216-131A	341300	Part - Control	
	14485	IML Machine	1		341300	IML, IML Machines	1
	14486	IML Machine	1		341300	IML Machine	1
	14487	IML, IML Machines Without Backlash Eliminator or Auto Table Cycle	1	216-131A	341300	Pin - Taper	1
	14488	IML, IML Machines With Backlash Eliminator and Auto Table Cycle	1	216-131A	341300	IML, IML Machines	1
	14489	IML Machine Without Backlash Eliminator or Auto Table Cycle	1	216-131A	341300	IML Machine	1
	14490	IML Machine With Backlash Eliminator and Auto Table Cycle	1	216-131A	341300	Lower - Auto Table Feed	1
2JM-134A	14491	Pin - Taper	1		341300	IML, IML Machines	1
2JM-131A	14492	IML, IML Machines	1		341300	IML Machine	1
	14493	IML Machine	1	216-131A	341300	Pin - Taper	1
	14494	IML Machine	1	216-131A	341300	Washer - Lock	1
	14495	IML Machine	1	216-131A	341300	Pin - Nut	1
	14496	IML Machine	1	216-131A	341300	Washer	1
	14497	IML Machine	1	216-131A	341300	Pin - Nut	1
	14498	IML Machine	1	216-131A	341300	Washer	1
	14499	IML Machine	1	216-131A	341300	Pin - Nut	1
	14500	IML Machine	1	216-131A	341300	Washer	1
	14501	IML Machine	1	216-131A	341300	Pin - Nut	1
	14502	IML Machine	1	216-131A	341300	Washer	1
	14503	IML Machine	1	216-131A	341300	Pin - Nut	1
	14504	IML Machine	1	216-131A	341300	Washer	1
	14505	IML Machine	1	216-131A	341300	Pin - Nut	1
	14506	IML Machine	1	216-131A	341300	Washer	1
	14507	IML Machine	1	216-131A	341300	Pin - Nut	1
	14508	IML Machine	1	216-131A	341300	Washer	1
	14509	IML Machine	1	216-131A	341300	Pin - Nut	1
	14510	IML Machine	1	216-131A	341300	Washer	1
	14511	IML Machine	1	216-131A	341300	Pin - Nut	1
	14512	IML Machine	1	216-131A	341300	Washer	1
	14513	IML Machine	1	216-131A	341300	Pin - Nut	1
	14514	IML Machine	1	216-131A	341300	Washer	1
	14515	IML Machine	1	216-131A	341300	Pin - Nut	1
	14516	IML Machine	1	216-131A	341300	Washer	1
	14517	IML Machine	1	216-131A	341300	Pin - Nut	1
	14518	IML Machine	1	216-131A	341300	Washer	1
	14519	IML Machine	1	216-131A	341300	Pin - Nut	1
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	14521	IML Machine	1	216-131A	341300	Pin - Nut	1
	14522	IML Machine	1	216-131A	341300	Washer	1
	14523	IML Machine	1	216-131A	341300	Pin - Nut	1
	14524	IML Machine	1	216-131A	341300	Washer	1
	14525	IML Machine	1	216-131A	341300	Pin - Nut	1
	14526	IML Machine	1	216-131A	341300	Washer	1
	14527	IML Machine	1	216-131A	341300	Pin - Nut	1
	14528	IML Machine	1	216-131A	341300	Washer	1
	14529	IML Machine	1	216-131A	341300	Pin - Nut	1
	14530	IML Machine	1	216-131A	341300	Washer	1
	14531	IML Machine	1	216-131A	341300	Pin - Nut	1
	14532	IML Machine	1	216-131A	341300	Washer	1
	14533	IML Machine	1	216-131A	341300	Pin - Nut	1
	14534	IML Machine	1	216-131A	341300	Washer	1
	14535	IML Machine	1	216-131A	341300	Pin - Nut	1
	14536	IML Machine	1	216-131A	341300	Washer	1
	14537	IML Machine	1	216-131A	341300	Pin - Nut	1
	14538	IML Machine	1	216-131A	341300	Washer	1
	14539	IML Machine	1	216-131A	341300	Pin - Nut	1
	14540	IML Machine	1	216-131A	341300	Washer	1
	14541	IML Machine	1	216-131A	341300	Pin - Nut	1
	14542	IML Machine	1	216-131A	341300	Washer	1
	14543	IML Machine	1	216-131A	341300	Pin - Nut	1
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	14545	IML Machine	1	216-131A	341300	Pin - Nut	1
	14546	IML Machine	1	216-131A	341300	Washer	1
	14547	IML Machine	1	216-131A	341300	Pin - Nut	1
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	14559	IML Machine	1	216-131A	341300	Pin - Nut	1
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	14573	IML Machine	1	216-131A	341300	Pin - Nut	1
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	14575	IML Machine	1	216-131A	341300	Pin - Nut	1
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	14586	IML Machine	1	216-131A	341300	Washer	1
	14587	IML Machine	1	216-131A	341300	Pin - Nut	1
	14588	IML Machine	1	216-131A	341300	Washer	1
	14589	IML Machine	1	216-131A	341300	Pin - Nut	1
	14590	IML Machine	1	216-131A	341300	Washer	1
	14591	IML Machine	1	216-131A	341300	Pin - Nut	1
	14592	IML Machine	1	216-131A	341300	Washer	1
	14593	IML Machine	1	216-131A	341300	Pin - Nut	1
	14594	IML Machine	1	216-131A	341300	Washer	1
	14595	IML Machine	1	216-131A	341300	Pin - Nut	1
	14596	IML Machine	1	216-131A	341300	Washer	1
	14597	IML Machine	1	216-131A	341300	Pin - Nut	1
	14598	IML Machine	1	216-131A	341300	Washer	1
	14599	IML Machine	1	216-131A	341300	Pin - Nut	1
	14600	IML Machine	1	216-131A	341300	Washer	1
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	14602	IML Machine	1	216-131A	341300	Washer	1
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	14604	IML Machine	1	216-131A	341300	Washer	1
	14605	IML Machine	1	216-131A	341300	Pin - Nut	1
	14606	IML Machine	1	216-131A	341300	Washer	1
	14607	IML Machine	1	216-131A	341300	Pin - Nut	1
	14608	IML Machine	1	216-131A	341300	Washer	1
	14609	IML Machine	1	216-131A	341300	Pin - Nut	1
	14610	IML Machine	1	216-131A	341300	Washer	1
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	14614	IML Machine	1	216-131A	341300	Washer	1
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	14630	IML Machine	1	216-131A	341300	Washer	1
	14631	IML Machine	1	216-131A	341300	Pin - Nut	1
	14632	IML Machine	1	216-131A	341300	Washer	1
	14633	IML Machine	1	216-131A	341300	Pin - Nut	1
	14634	IML Machine	1	216-131A	341300	Washer	1
	14635	IML Machine	1	216-131A	341300	Pin - Nut	1
	14636	IML Machine	1	216-131A	341300	Washer	1
	14637	IML Machine	1	216-131A	341		

UNIVERSAL SADDLE



CINCINNATI NOS 2 ML 2 MI AND 3 MI MILLING MACHINES

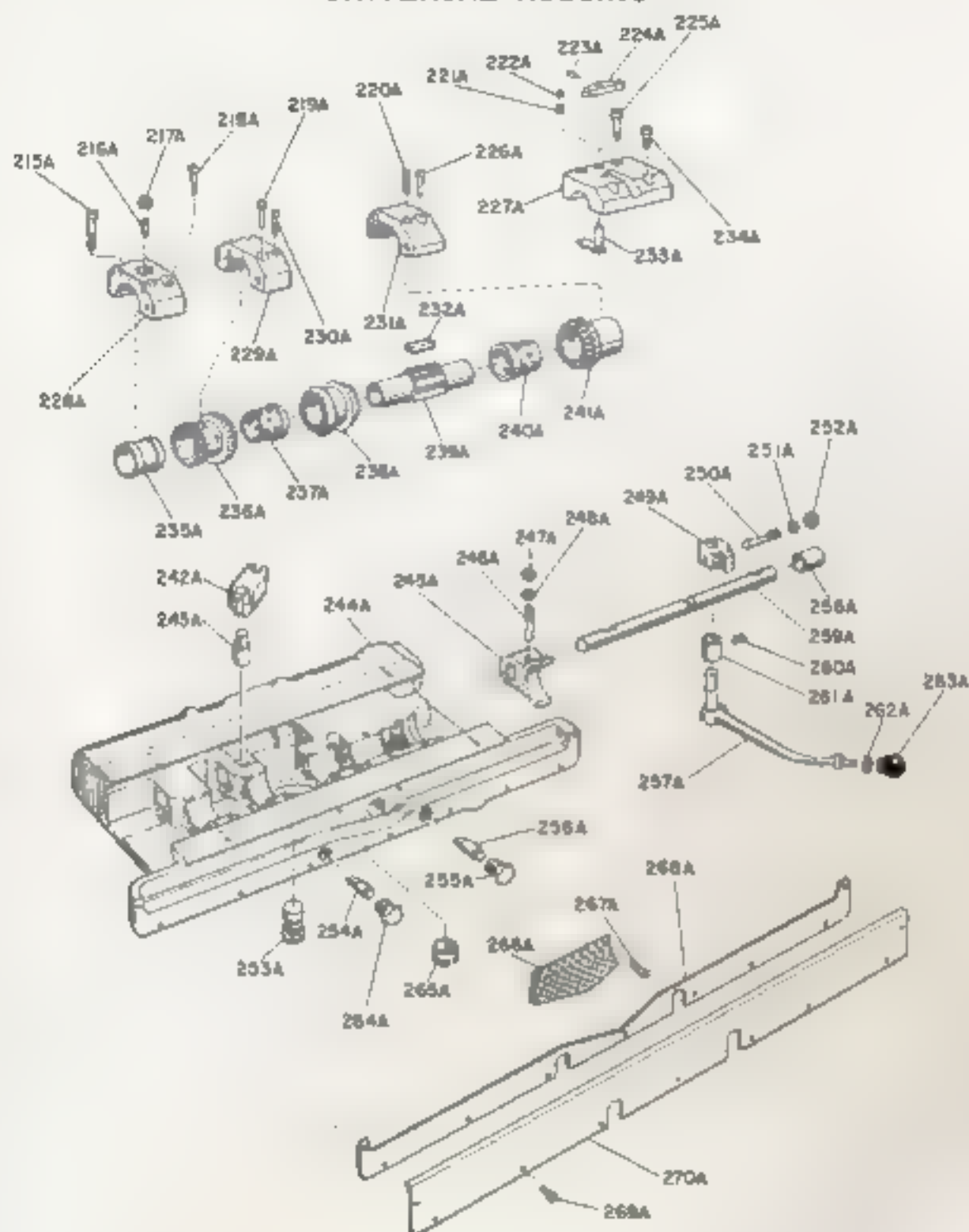
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 99, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JM (Continued)

UNIVERSAL MACHINES

Key No	Part No	Part Name	Amplified	Key No	Part No	Part Name	Amplified
2JM-143A	170887	Nut - Positive Stop	1	2JM-207A	944	Nut - Hex	1
2JM-184A	130454	Org - Positive Stop	1	2JM-208A	1804	Screw	1
2JM-185A	3304	Screw	1	2JM-209A	3434	Pin	1
2JM-186A	2434	Pin	1	2JM-210A		Gear - Mill	1
2JM-187A	18070	Nut	1	2JM-211A	170430	Ball, Mill Machine	1
2JM-188A		Saddle - Universal	1	2JM-212A	170431	Ball Machine	1
	114433	Ball, Mill Machine	1	2JM-213A	170432	Ball, Mill Machine	1
	130454	Ball Machine	1	2JM-214A	170433	Ball, Mill Machine	1
2JM-189A	170434	Ball - Top	1	2JM-215A	170434	Ball, Mill Machine	1
2JM-190A	130455	Org - Saddle	1	2JM-216A	170435	Ball, Mill Machine	1
2JM-191A	944	Nut - Hex	1	2JM-217A	170436	Ball, Mill Machine	1
2JM-192A		Gear - Worm Drive	1	2JM-218A	170437	Ball, Mill Machine	1
	170438	Ball, Mill Machine	1	2JM-219A	170438	Ball, Mill Machine	1
2JM-193A	170439	Ball, Mill Machine	1	2JM-220A	170439	Ball, Mill Machine	1
2JM-194A	3305	Nut	1	2JM-221A	170440	Ball, Mill Machine	1
		Washer - Filing	1	2JM-222A	170441	Ball, Mill Machine	1
	114433	Ball, Mill Machine	1	2JM-223A	170442	Ball, Mill Machine	1
	130457	Ball Machine	1	2JM-224A	170443	Ball, Mill Machine	1
2JM-195A	104049	Cone - Bearing	1	2JM-225A	170444	Ball, Mill Machine	1
2JM-196A	104050	Cup - Bearing	1	2JM-226A	170445	Ball, Mill Machine	1
2JM-197A	1330	Ball - Top	1	2JM-227A	170446	Ball, Mill Machine	1
2JM-198A	120834	Org - Saddle Feed - Front	1	2JM-228A	170447	Ball, Mill Machine	1
2JM-199A	130457	Nut - Positive Stop	1	2JM-229A	170448	Ball, Mill Machine	1
2JM-200A	130458	Org - Positive Stop	1	2JM-230A	170449	Ball, Mill Machine	1

UNIVERSAL HOUSING



CINCINNATI NOS 2 MI, 3 MI AND 3 MI MILUNG MACHINES

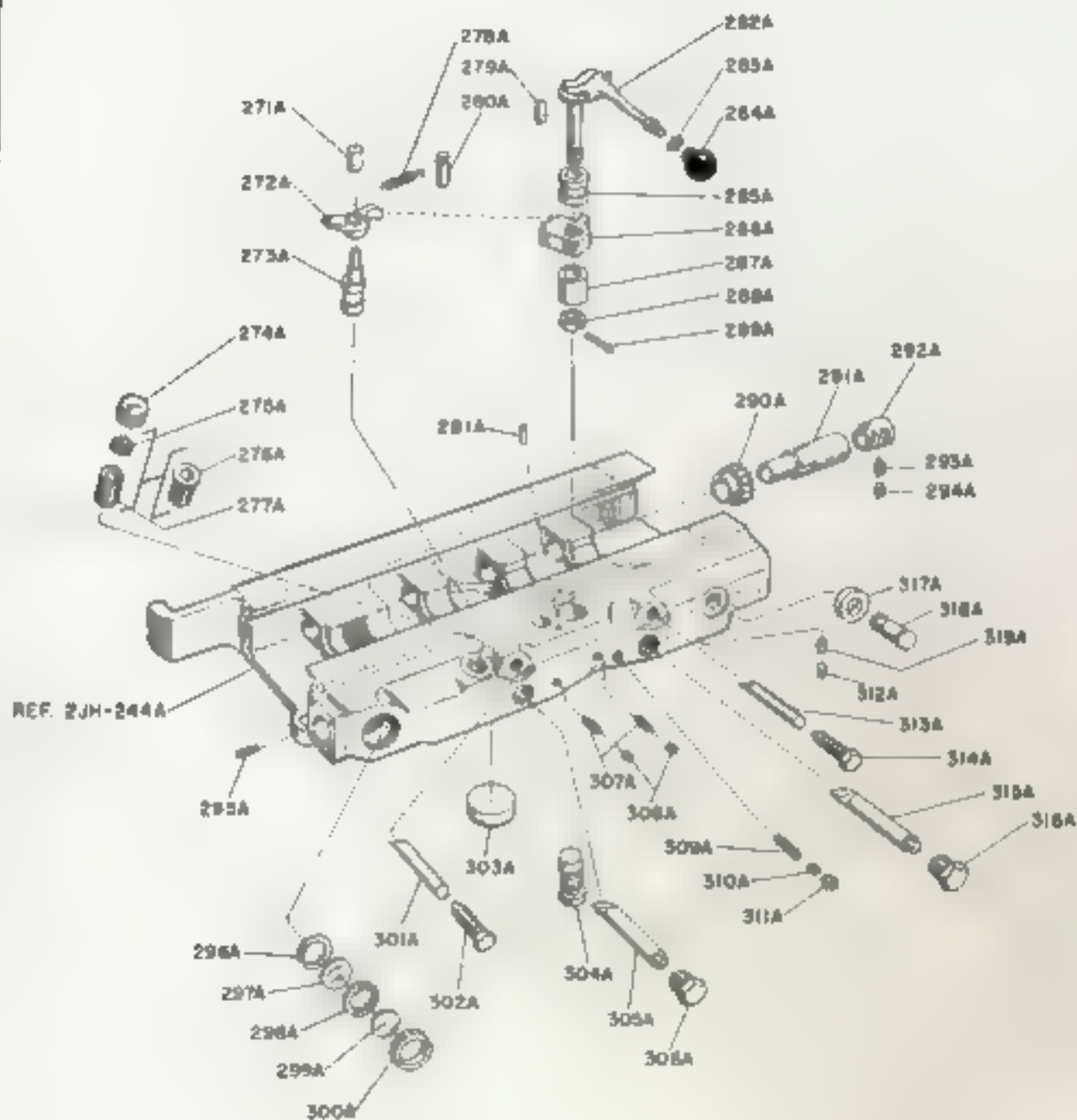
WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Am't. Used	Key No.	Part No.	Part Name	Am't. Used
2JH-215A	222	Screw	2	2JH-243A	511364	Roll - Lower	1
	224	Roll, 2MI Machine	2		52404	Roll, 2MI Machine	1
2JH-218A	214	Screw - Set	1	2JH-244A		Rolling - Guide	1
2JH-219A	154	Roll - Set	1		134042	2MI Machine Without Backlash	1
2JH-219A		Pin - Taper	1			Eliminator	1
	111408	Roll, 2MI Machine	2		132044	2MI Machine With Backlash Eliminator	1
	111412	2MI Machine	2		134341	2MI Machine Without Backlash	1
2JH-219A	111408	Pin - Taper	1			Eliminator	1
2JH-220A	222	Screw	2		132044	2MI Machine With Backlash Eliminator	1
2JH-221A	222	Screw - Set	1		134341	2MI Machine Without Backlash	1
2JH-222A	224	Screw - Set	1			Eliminator	1
2JH-223A	154	Roll - Taper	1		134371	2MI Machine With Backlash Eliminator	1
2JH-234A		Cap - Locknut	1	2JH-245A		Roll - Check	1
	134334	Roll, 2MI Machine	1		134044	Roll, 2MI Machine	1
	134335	2MI Machine	1		111345	2MI Machine	1
2JH-234A	107053	Screw - Shoulder	2	2JH-246A	24344	Pin - Lock	1
2JH-236A	111404	Pin - Taper	1	2JH-247A	842	Roll - Set	1
2JH-237A		Cap - Bearing - Left	1	2JH-248A	2712	Washer - Lock	1
	134337	Roll, 2MI Machine	1	2JH-249A		Lever - Rear Table Feed	1
	134338	2MI Machine Without Backlash	1		134313	Roll, 2MI Machine	1
		Eliminator	1		52407	2MI Machine	1
	134339	2MI Machine With Backlash Eliminator	1	2JH-250A	2343	Pin - Lock	1
2JH-238A		Cap - Bearing - Right	1	2JH-251A	2128	Washer - Lock	1
	134314	Roll, 2MI Machine	1	2JH-252A	2144	Pin - Set	1
	111325	2MI Machine	1	2JH-253A	113432	Clamp - Guide Rolling	1
2JH-238A		Cap - Bearing - Right Center	1	2JH-254A		Wedge - Rear Clamping	1
	134323	Roll, 2MI Machine	1		134313	Roll, 2MI Machine	1
	134324	2MI Machine	1		113432	2MI Machine	1
2JH-238A	222	Screw	2	2JH-255A		Screw - Rear Guide Clamp	1
2JH-238A		Cap - Bearing - Left Center	1		134323	Roll, 2MI Machine	1
	111410	Roll, 2MI Machine	1		52407	2MI Machine	1
	111430	2MI Machine	1	2JH-256A		Wedge - Rear Clamping	1
2JH-238A		Key	1		134313	Roll, 2MI Machine	1
	50623	Roll, 2MI Machine	1		123484	2MI Machine	1
	111325	2MI Machine	1	2JH-257A		Roll - Rear Control	1
2JH-238A	134333	Roll, 2MI Machine	1		110338	Roll, 2MI Machine	1
	134334	2MI Machine	1		134344	2MI Machine	1
2JH-238A	1244	Screw	2	2JH-258A	2432	Rolling	1
2JH-238A		Rolling - Lead Screw	1	2JH-259A		Roll - Check Mount	1
	121344	Roll, 2MI Machine Without Short Lead	1		134313	Roll, 2MI Machine	1
		Attachment	1		134313	2MI Machine	1
	124443	2MI Machine Without Short Lead	1	2JH-260A	222	Screw - Set	1
		Attachment	1	2JH-261A	111343	Rolling - Rear Control Mount	1
2JH-261A		Cap - Roll - Right	1	2JH-262A	2128	Washer - Lock	1
	134347	Roll, 2MI Machine Without Short Lead	1	2JH-263A	113432	Roll - Guide	1
		Attachment	1	2JH-264A		Screw - Rear Guide Clamp	1
	134372	2MI Machine Without Short Lead	1		134313	Roll, 2MI Machine	1
		Attachment With Backlash Eliminator	1		52407	2MI Machine	1
2JH-264A		Rolling - Steel Gear	1	2JH-265A		Roll - Guide	1
	114444	Roll, 2MI Machine	1		113432	Roll, 2MI Machine	1
	114445	2MI Machine	1		52407	2MI Machine	1
2JH-265A		Chain - Lead Screw	1	2JH-266A		Roller - Rear Guide	1
	134347	Roll, 2MI Machine	1		113432	Roll, 2MI Machine	1
	134348	2MI Machine	1		113432	2MI Machine	1
2JH-270A		Screw - Lead Screw	1	2JH-267A	222	Screw	2
	114446	Roll, 2MI Machine Without Short Lead	1	2JH-268A		Guard - Wedge Guard	1
		Attachment	1		113432	Roll, 2MI Machine	1
	134373	2MI Machine Without Short Lead	1		134344	2MI Machine	1
		Attachment	1	2JH-269A		Screw	1
2JH-270A		Rolling - Steel Gear	1		222	Roll, 2MI Machine	1
	114446	Roll, 2MI Machine	1		222	2MI Machine	1
	134447	2MI Machine	1	2JH-270A		Guard - Guide	1
2JH-271A		Cap - Roll - L. R.	1		113432	Roll, 2MI Machine	1
	134347	Roll, 2MI Machine	1		113432	2MI Machine	1
	134448	2MI Machine	1		134344	2MI Machine	1
2JH-272A		Lever - Check Stopper	1				
	114325	Roll, 2MI Machine	1				
	113907	2MI Machine	1				

CONTROL LINKAGE



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

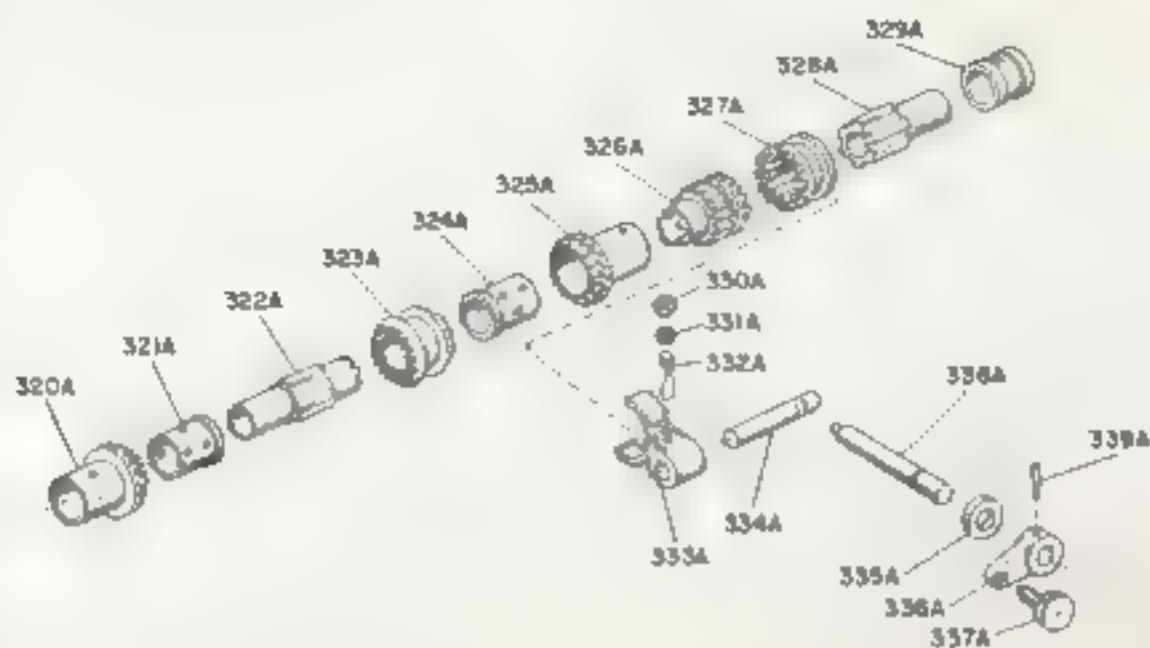
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JM (Continued)

UNIVERSAL MACHINES

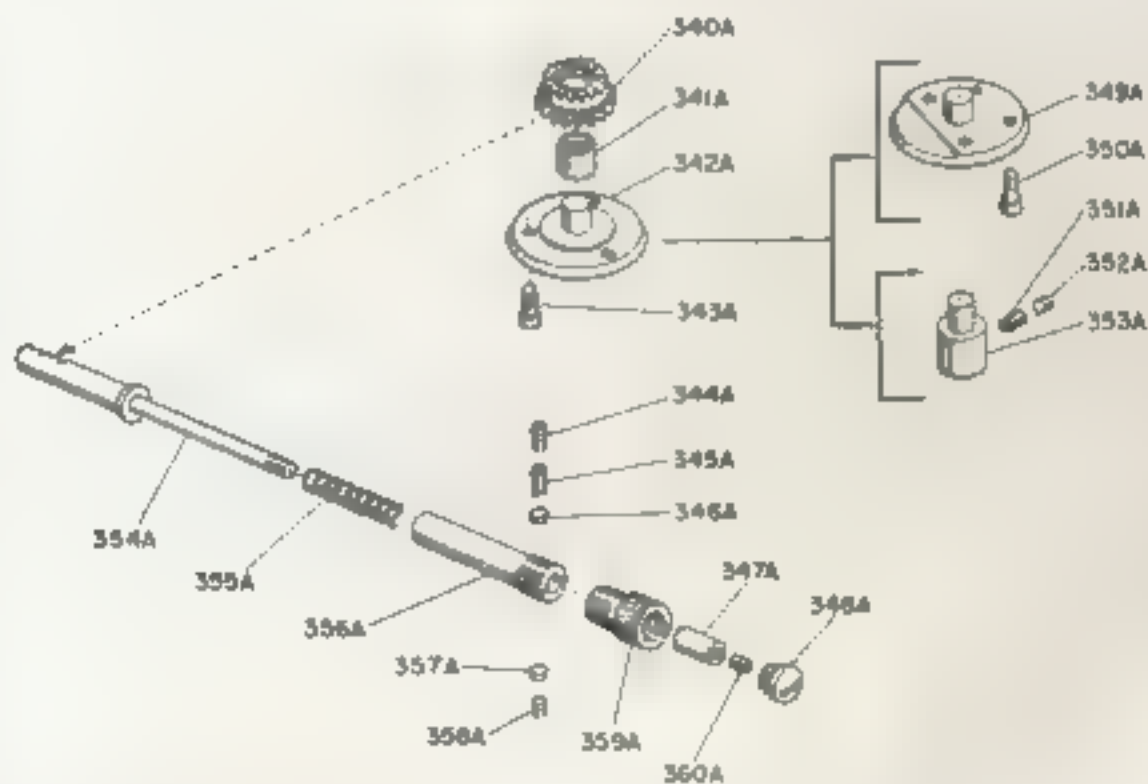
Key No.	Part No.	Part Name	Amount Used	Key No.	Part No.	Part Name	Amount Used
2JM-271A		Bushing - Eccentric Shaft		2JM-273A	3333	Screw - Set	1
	67020	2MI, 2ML Machines	1	2JM-274A	3333	Screw - Set	1
	109170	2MI Machines	1	2JM-275A	3337	Screw - Set	1
2JM-272A		Levers - Detent		2JM-276A	3330	Bracket - Oil Gauge	1
	84432	2MI, 2ML Machines	1	2JM-277A	40762	Ball - Oil Gauge	1
	127500	2MI Machines	1	2JM-278A	4084	Gasket - Oil Gauge	1
2JM-273A		Stud - Detent Eccentric		2JM-279A	3849	Ring - Oil Gauge	1
	135020	2MI, 2ML Machines	1	2JM-280A	41377	Cover - Oil Gauge	1
	67019	2MI Machines	1	2JM-281A		Screw - Oil Clamping	
2JM-274A	3886	Cap - Oil Filter	1		40891	2MI, 2ML Machines	1
2JM-275A	114051	Bracket - Oil Filter (2MI Machines Only)	1		40891	2MI Machines	1
2JM-276A	71937	Adapter - Oil Filter (2MI, 2ML Machines Only)	1	2JM-282A		Screw - New Head Set	
2JM-277A	3412	Nipple - Oil Filter (2MI Machines Only)	1		11	2MI, 2ML Machines	1
2JM-278A		Bracket - Detent Lever			2300	2MI Machines	1
	71525	2MI, 2ML Machines	1	2JM-283A	3555	Plug (2MI Machines Only)	1
	34137	2MI Machines	1	2JM-284A	115051	Clamp - Saddle Housing	1
2JM-279A	3381	Key	1	2JM-285A		Wedge	
2JM-280A		Pin - Spring			40811	2MI, 2ML Machines	1
	84433	2MI, 2ML Machines	1		115000	2MI Machines	1
	109171	2MI Machines	1	2JM-286A	43070	Screw - Clamp	1
2JM-281A	1384	Pin	1	2JM-287A	3333	Screw - Set	1
2JM-282A	104385	Lever - Table Trip	1	2JM-288A	3011	Screw - Set	1
2JM-283A	8134	Washer - Lock	1	2JM-289A	3230	Screw - Set	1
2JM-284A	134051	Ball - Hand	1	2JM-290A	3317	Screw - Set	1
2JM-285A		Bushing - Table Feed Lever - Upper		2JM-291A	10441	Plug - Pipe	1
	111300	2MI, 2ML Machines	1	2JM-292A	1911	Screw - Set	1
	114080	2MI Machines	1	2JM-293A		Screw - Oil Clamping	
2JM-286A		Detent Feed Trip Lever			40831	2MI, 2ML Machines	1
	137501	2MI, 2ML Machines	1		34010	2MI Machines	1
	112817	2MI Machines	1	2JM-294A		Screw - New Head Set	
2JM-287A		Bushing - Table Feed Lever - Lower			11	2MI, 2ML Machines	1
	114381	2MI, 2ML Machines	1		2300	2MI Machines	1
	114050	2MI Machines	1	2JM-295A		Wedge	
2JM-288A	43319	Nut - Feed Trip Plunger	1		110520	2MI, 2ML Machines	1
2JM-289A	8105	Pin - Control	1		110520	2MI Machines	1
2JM-290A		Guide - Attachment Drier		2JM-296A	85070	Screw - Clamp	1
	114720	2MI, 2ML Machines	1	2JM-297A	114130	Spacers	1
	120402	2MI Machines	1	2JM-298A	110554	Plug - Eccentric Shaft (2MI, 2ML Machines)	1
2JM-291A		Sleeve - Drive				Head Attachment	
	115500	2MI, 2ML Machines	1	2JM-299A	3232	Screw - Set	1
	114305	2MI Machines	1				
2JM-292A		Bushing					
	115501	2MI, 2ML Machines	1				
	119473	2MI Machines	1				

SHORT LEAD ATTACHMENT



164 RR

BACKLASH ELIMINATOR



172 RR

CINCINNATI NOS 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19 "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

UNIVERSAL MACHINES

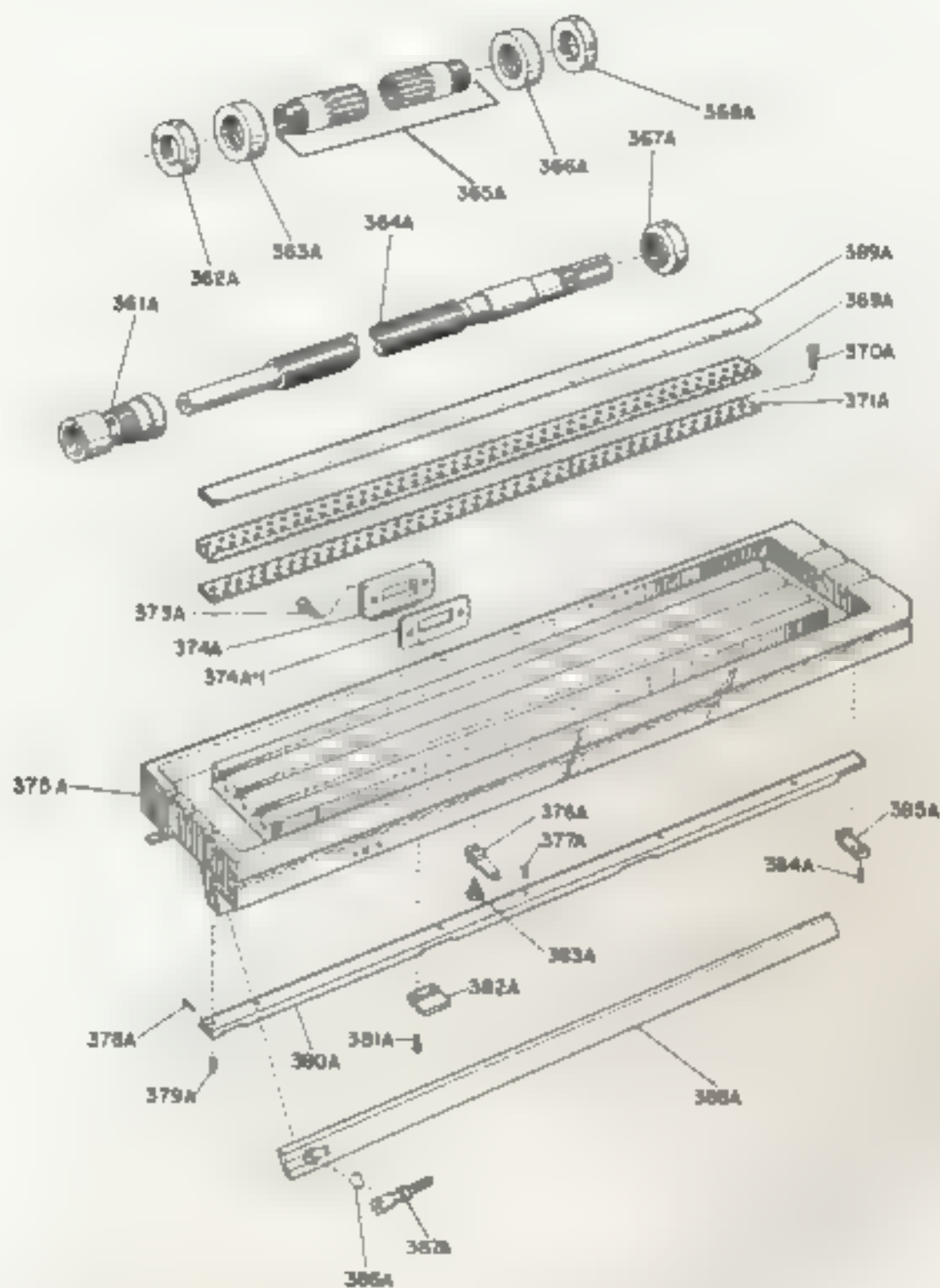
Key No.	Part No.	Part Name	Am't Used	Key No.	Part No.	Part Name	Am't Used
2JH-320A	154460	Gear - Bevel - L & R	1	2JH-325A	114530	Electr. Lead to top - Short	1
	166370	2MI, 2ML Machines	1		114534	2MI, 2ML Machines	1
2JH-321A		Bushing	1	2JH-325A	114702	Bushing - Lead screw	1
	110468	2MI, 2ML Machines	1		114704	2MI, 2ML Machines	1
2JH-322A	114738	Gears - Lead Screw - Long	1	2JH-326A	847	Pin - Key	1
	166374	2MI, 2ML Machines	1	2JH-327A	3034	Washer - Lock	1
2JH-323A		Clutch	1	2JH-327A	3034	Pin - Lock	1
	114734	2MI, 2ML Machines	1		114734	Pin - Clutch	1
	166374	2MI, 2ML Machines	1		114734	2MI, 2ML Machines	1
2JH-324A		Bushing	1	2JH-327A	114734	Pin - Clutch	1
	110468	2MI, 2ML Machines	1		114734	2MI, 2ML Machines	1
2JH-325A		Gear - Bevel - R H	1	2JH-327A	114734	Pin - Clutch	1
	166370	2MI, 2ML Machines	1		114734	2MI, 2ML Machines	1
2JH-326A		Clutch - Driving Attachment	1	2JH-327A	114734	Pin - Clutch	1
	114734	2MI, 2ML Machines	1		114734	2MI, 2ML Machines	1
2JH-327A		Clutch - Lead Screw	1		114734	2MI, 2ML Machines	1
	114734	2MI, 2ML Machines	1		114734	2MI, 2ML Machines	1
	166370	2MI, 2ML Machines	1		114734	2MI, 2ML Machines	1

SADDLE TABLE — UNIT No. 2JH (Continued)

2MI, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Am't Used	Key No.	Part No.	Part Name	Am't Used
2JH-340A	109373	Gears - Bevel - Lead Screw - Crown	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
	109373	2MI, 2ML Machines	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-341A	109373	Bushing - Bevel	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-342A	109373	Support - Bearing (2MI, 2ML Machines Only)	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-343A	1213	Screw - 2MI, 2ML Machines Only	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-344A	7211	Screw - 2MI, 2ML, 3MI Plain 2MI Plain	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-345A	1213	Screw - 2MI, 2ML, 3MI Plain 2MI Plain	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-346A	109373	Ring (2MI, 2ML, 3MI Plain 2MI Plain)	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-347A	109373	Stop - Bushing	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-348A	109373	Screw	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1
2JH-349A	109373	Support - Bearing (2MI Universal Machines Only)	1	2JH-347A	3213	Screw - 2MI Universal Machines Only	1

TABLE, LEADSCREW, AND BACKLASH NUTS



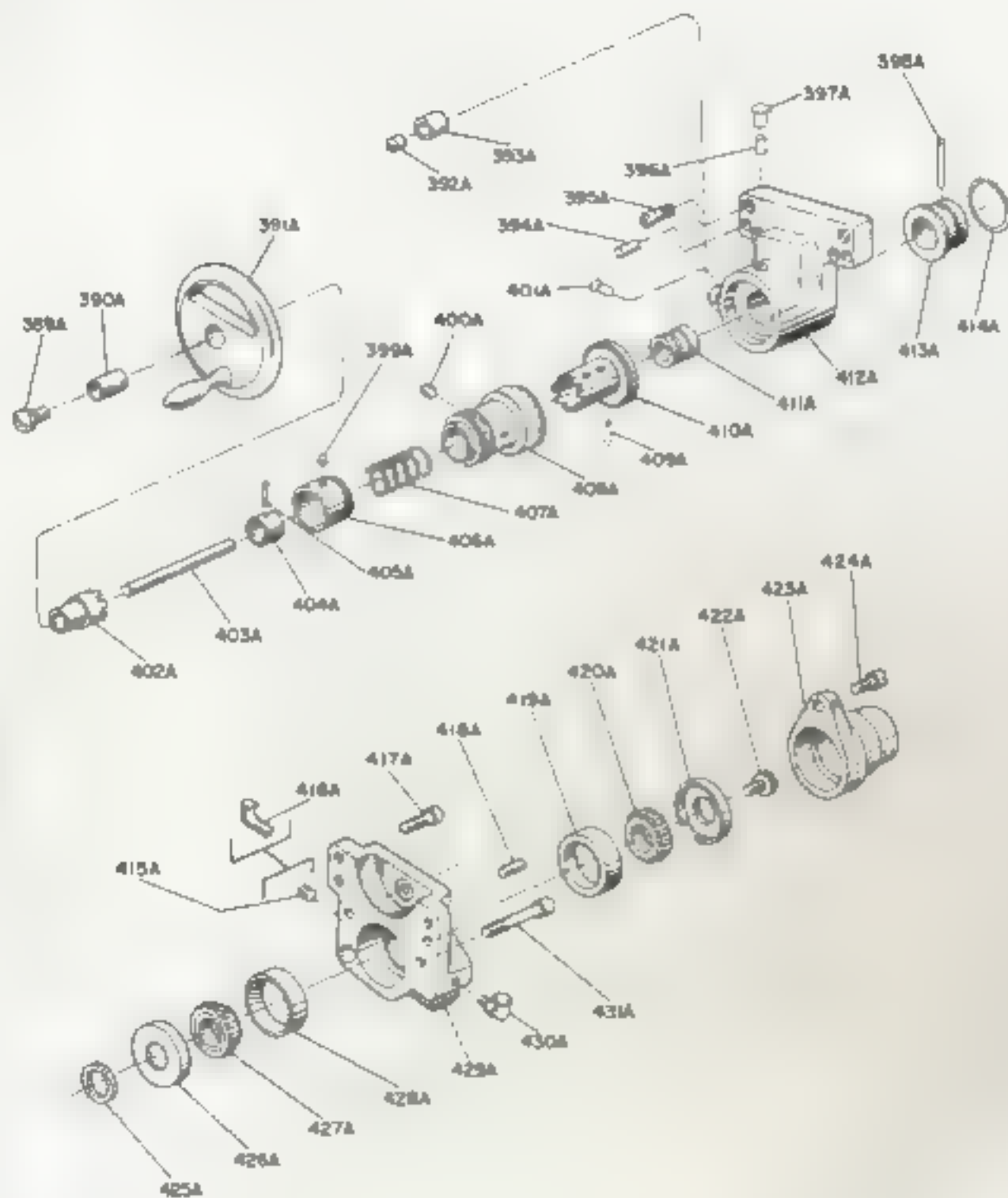
1. 1월 1일
2. 1월 15일
3. 1월 31일

CINCINNATI NOS 2 ML 2 MI AND 3 MI MILUNG MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)3AM, 2AM AND 3AM PLAIN AND UNIVERSAL
2AM VERTICAL[illegible]

TABLE APRONS



CINCINNATI NOS. 2 ML 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued)

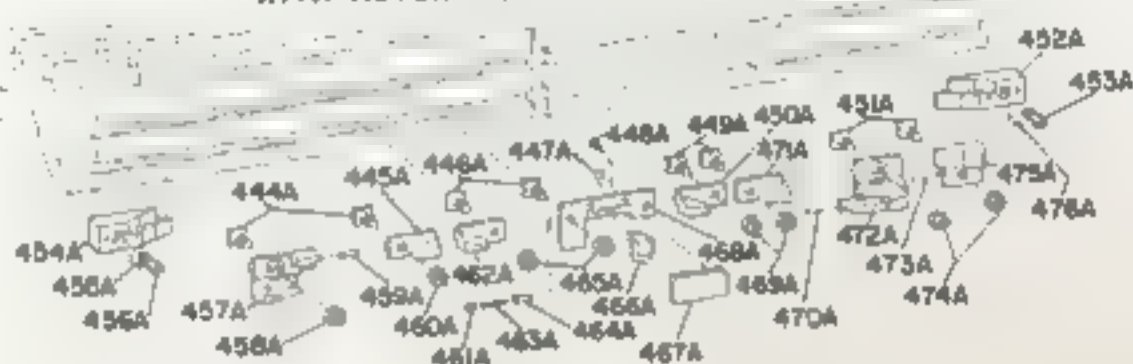
2ML, 2MI AND 3MI PLAIN AND UNIVERSAL
2MI VERTICAL

Key No.	Part No.	Part Name	Am. Used	Key No.	Part No.	Part Name	Am. Used
2JH-399A	9511	Screw - Retaining	1	2JH-411A	101154	Plug - Retaining	1
2JH-399A	101011	Shave - Handwheel	1	2JH-411A	100111	Plug - Pin (Without Short Lead Attachment)	1
2JH-399A	101001	Handwheel	1	2JH-411A	111001	Outer (2MI, 2ML Machines Without Short Lead Attachment)	1
2JH-399A	40911	Outer (2MI Machines With Short Lead Attachment Only)	1	2JH-411A	101111	Screw	1
2JH-399A	110201	Pin - Front Apron (2MI Machines With Short Lead Attachment Only)	1	2JH-411A	101111	2MI, 2ML Machines	2
2JH-399A	10011	Pin	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	2MI, 2ML Machines	2	2JH-411A	101111	Pin	1
2JH-399A	10011	2MI Machine	2	2JH-411A	101111	2MI, 2ML Machines	2
2JH-399A	10011	Screw	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	2MI, 2ML Machines	4	2JH-411A	101111	Cap - Bearing	1
2JH-399A	10011	2MI Machine	4	2JH-411A	101111	2MI, 2ML Machine	1
2JH-399A	10011	Pin - Pin	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	2MI, 2ML Machine	1	2JH-411A	101111	Comp. Bearing	1
2JH-399A	10011	2MI Machine	1	2JH-411A	101111	2MI, 2ML Machines	1
2JH-399A	10011	Outer	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	Pin - Handwheel	1	2JH-411A	101111	Rollers - Back Apron	1
2JH-399A	10011	Screw	1	2JH-411A	101111	2MI, 2ML Machine	1
2JH-399A	10011	Pin	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	Outer (2MI, 2ML Machines With Short Lead Attachment)	1	2JH-411A	101111	Screw	1
2JH-399A	10011	Clutch - Handwheel	1	2JH-411A	101111	Cover - Back Apron	1
2JH-399A	10011	Roller - Handwheel	1	2JH-411A	101111	Pin	1
2JH-399A	10011	2MI, 2ML Machine	1	2JH-411A	101111	Washer (2MI Machines Only)	1
2JH-399A	10011	2MI Machine	1	2JH-411A	101111	Rollers - Back Apron	1
2JH-399A	10011	Collar - Back Apron	1	2JH-411A	101111	2MI, 2ML Machine	1
2JH-399A	10011	Pin in Collar - Short	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	Bushing - Spring Retainer	1	2JH-411A	101111	Comp. Bearing	1
2JH-399A	10011	Spring	1	2JH-411A	101111	2MI, 2ML Machine	1
2JH-399A	10011	Clutch - Lead Screw	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	Pin - Pin	1	2JH-411A	101111	Cap - Bearing	1
2JH-399A	10011	Clutch - Lead Screw (2MI)	1	2JH-411A	101111	2MI, 2ML Machine	1
2JH-399A	10011	Bushing - Front Apron	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	Apron - Front	1	2JH-411A	101111	Apron - Rear	1
2JH-399A	10011	2MI, 2ML Machine	1	2JH-411A	101111	2MI, 2ML Machine	1
2JH-399A	10011	2MI Machine	1	2JH-411A	101111	2MI Machine	1
2JH-399A	10011	Collar - Flange	1	2JH-411A	101111	Outer	1
2JH-399A	10011	2MI, 2ML Machine	1	2JH-411A	101111	Screw	2
2JH-399A	10011	2MI Machine	1				

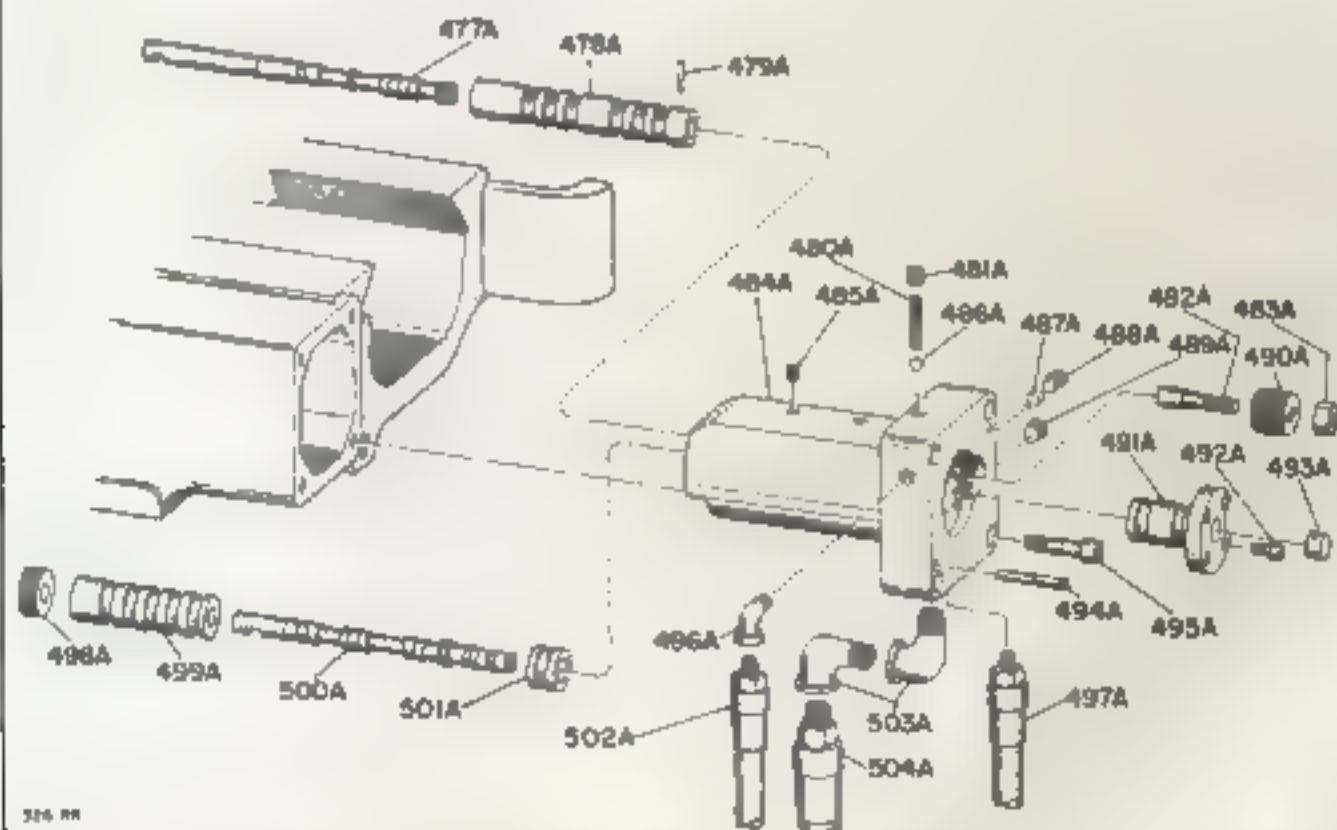
TABLE DOGS WITHOUT AUTOMATIC TABLE CYCLE



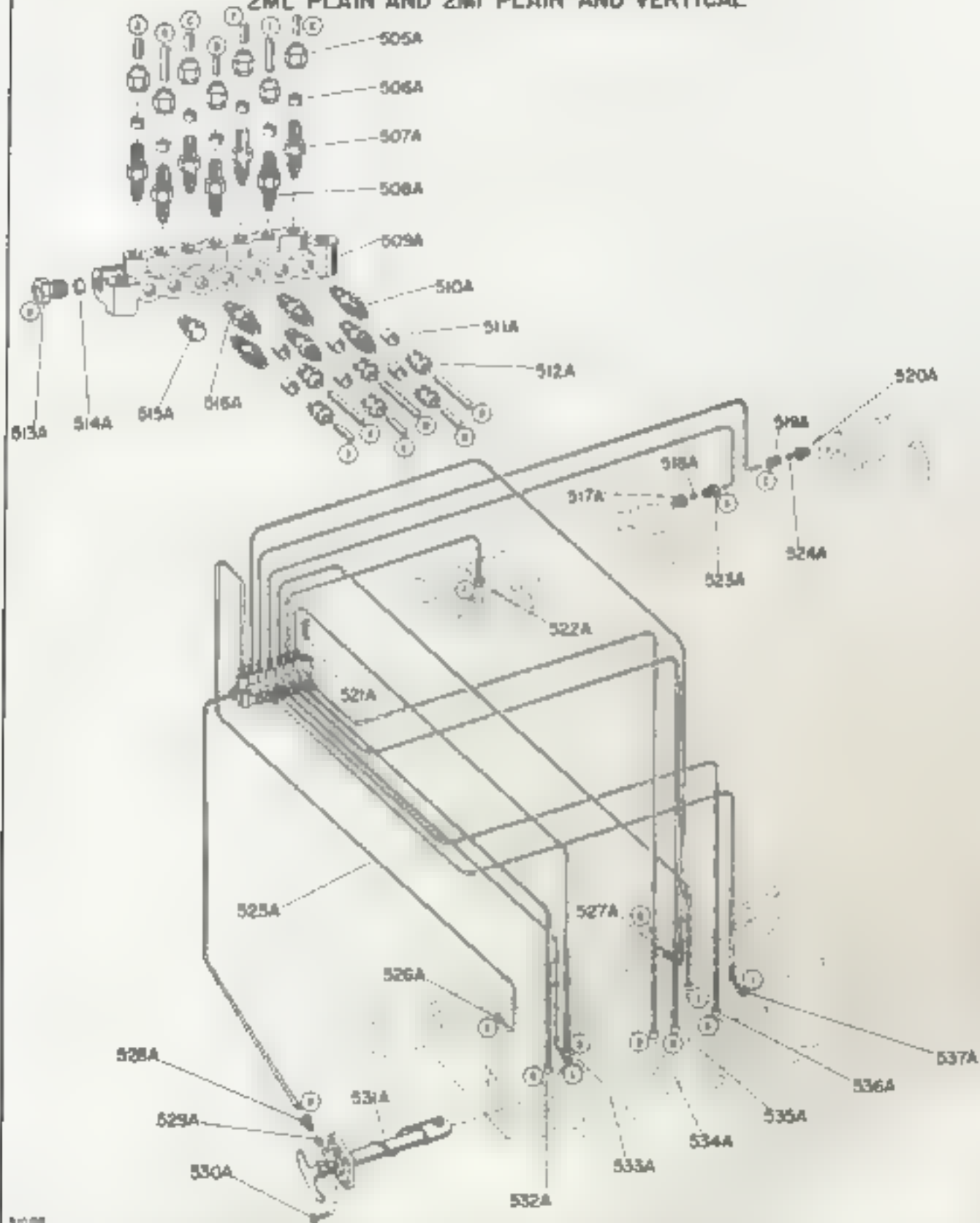
TABLE DOGS WITH AUTOMATIC TABLE CYCLE



AUTOMATIC TABLE CYCLE VALVE



SADDLE-TABLE LUBRICATION **2ML PLAIN AND 2MI PLAIN AND VERTICAL**



910/00

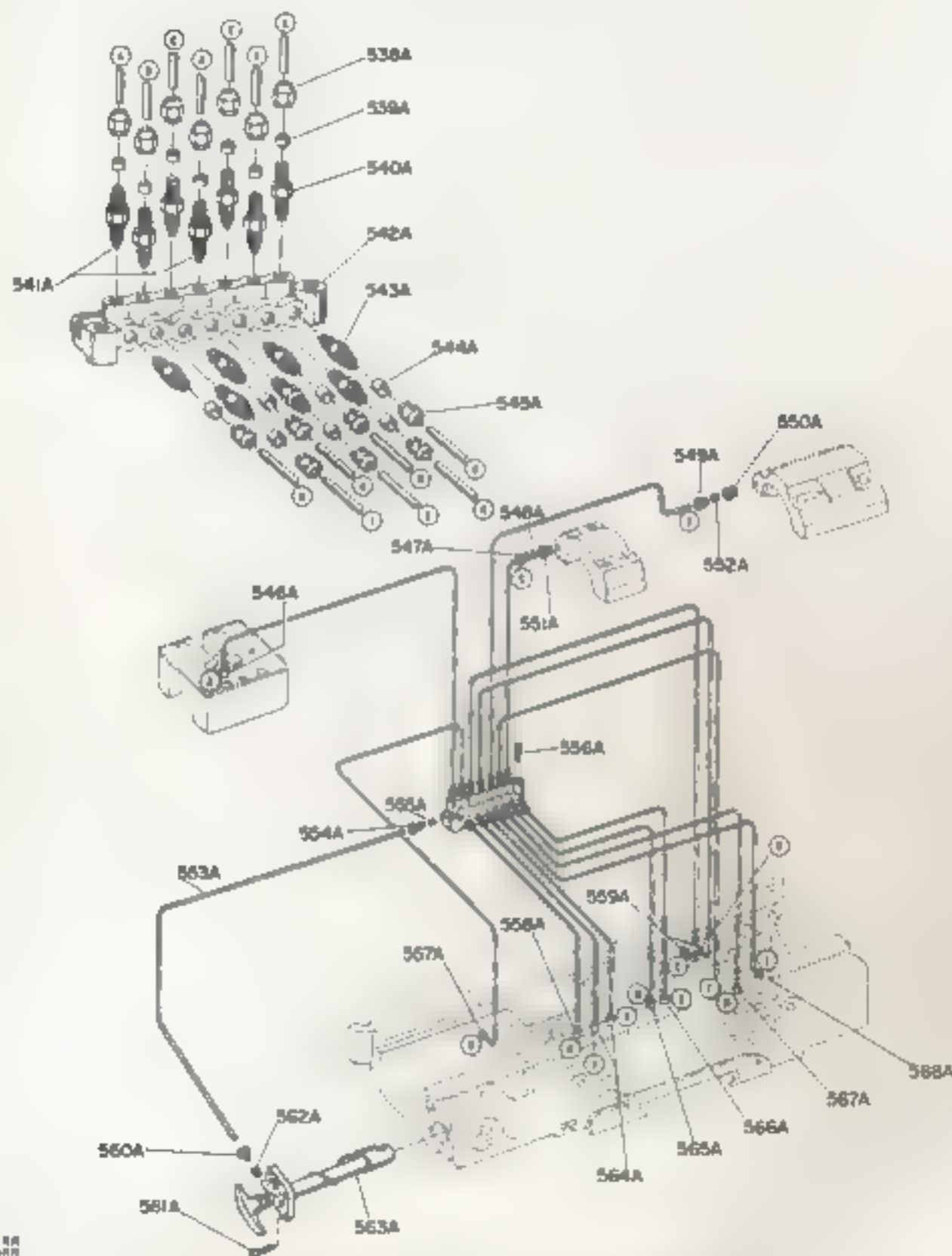
CINCINNATI NOS 2 M, 2 W AND 3 M MILLING MACHINES

WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 99, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JM (Continued) 3M PLAN MACHINES

Part No.	Part No.	Part Name	Ass. Cost	Part No.	Part Name	Ass. Cost	
12H-828A	314234	Nut - Compressor	7	12H-854A	314309	Nut - Compressor	1
12H-829A	314304	Nut - Compressor	7	12H-855A	314304	Nut - Compressor	1
12H-841A	314304	Plug - Drip	4	12H-856A	314304	Nut - Compressor	1
12H-844A	77188	Plug - Drip	2	12H-857A	77187	Plug - Oil Tube	1
12H-847A	111337	Adjuster	2	12H-858A	77187	Plug - Oil Tube	1
12H-848A	314304	Plug - Drip	7	12H-859A	77187	Plug - Oil Tube	1
12H-849A	314304	Nut - Compressor	7	12H-860A	314309	Nut - Compressor	1
12H-849A	314304	Nut - Compressor	7	12H-861A	314304	Nut - Compressor	1
12H-849A	77187	Plug - Oil Tube	1	12H-862A	314304	Adjuster - C. Support	1
12H-849A	314309	Nut - Compressor	1	12H-863A	96237	Plug - Lub. Line	1
12H-849A	314304	Nut - Compressor	1	12H-864A	77187	Plug - Oil Tube	2
12H-849A	314309	Nut - Compressor	1	12H-865A	77187	Plug - Oil Tube	1
12H-850A	314304	Adjuster - Drip	1	12H-866A	77187	Plug - Oil Tube	1
12H-851A	314309	Adjuster - Drip	1	12H-867A	77187	Plug - Oil Tube	1
12H-852A	314304	Nut - Compressor	1	12H-868A	77187	Plug - Oil Tube	1
12H-853A	314309	Timing List	1				

SADDLE-TABLE LUBRICATION 3MI PLAIN



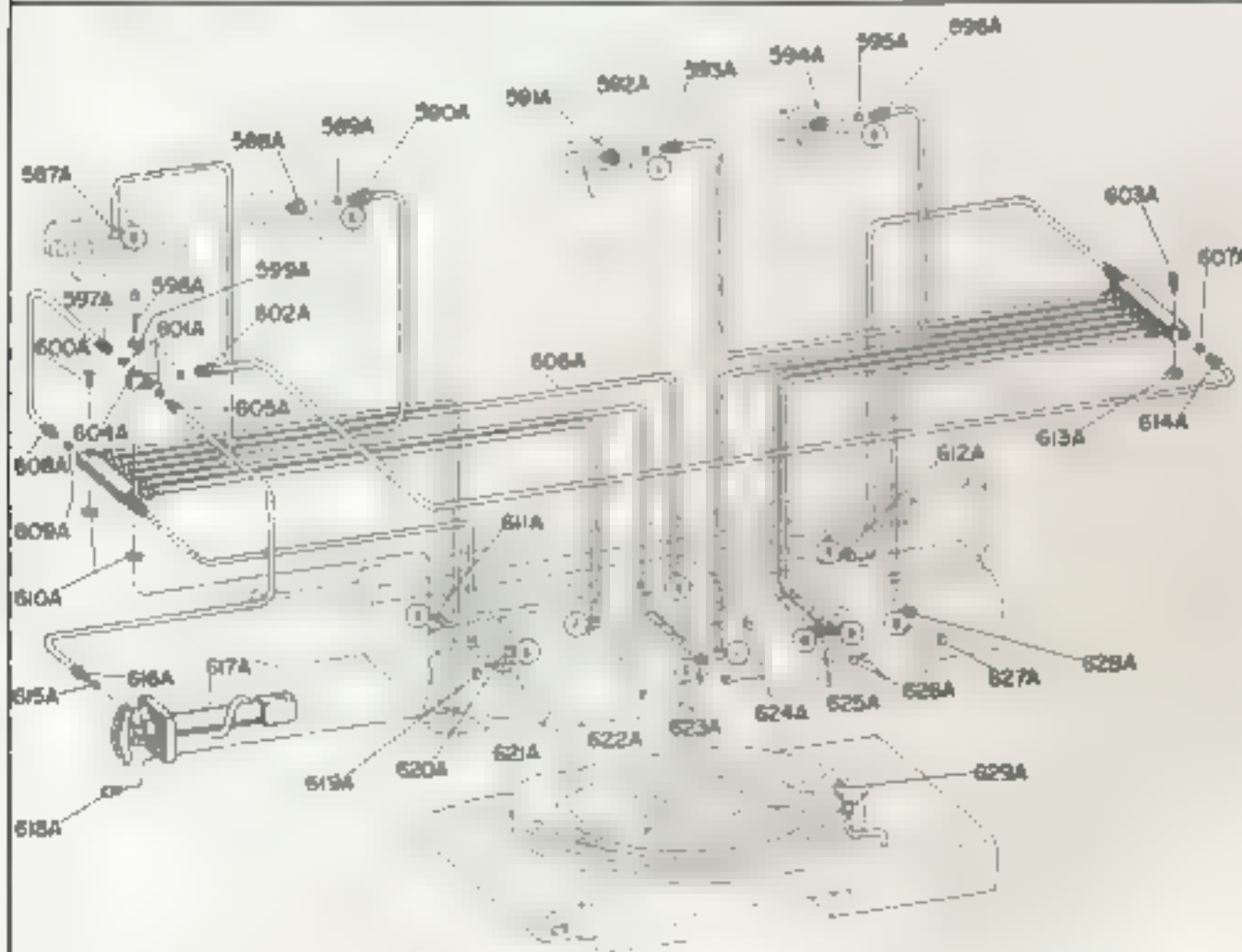
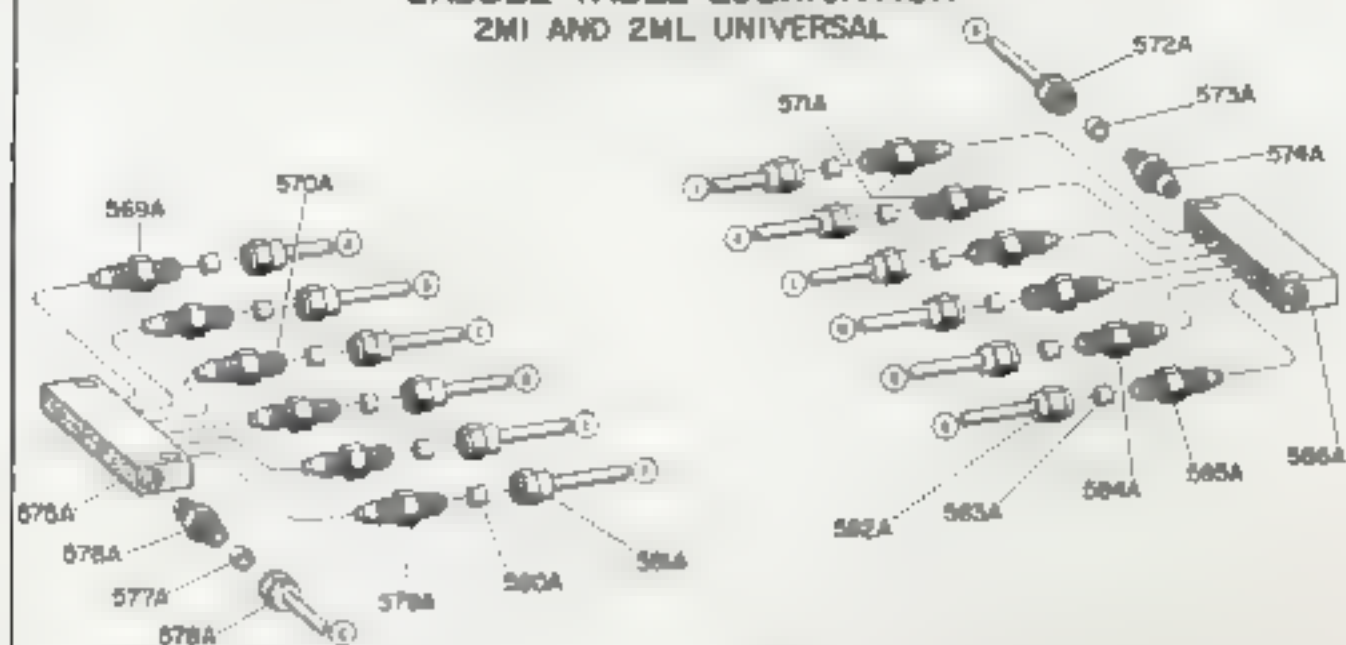
CINCINNATI NOS. 2 ML, 3 ML AND 3 M MILUNG MACHINE:

WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 19, "How to Order Repair Parts."

SADDLE TABLE — UNIT No. 2JH (Continued) 2ML PLAIN AND 3ML PLAIN AND VERTICAL MACHINES

Key No.	Part No.	Part Name	Qty. Used	Key No.	Part No.	Part Name	Qty. Used
2JH-505A	214384	Valv - Compression	1	2JH-522A	77137	Shut - Oil Tube	1
2JH-506A	214384	Shut - Compression	1	2JH-523A	214380	Shut - Compression	1
2JH-507A	220004	Plug - Drain	2	2JH-524A	77138	Shut - Compression	1
2JH-508A	77138	Plug - Drain	1	2JH-525A	111401	Timing - Link	1
2JH-509A	111401	Timing - Link	1	2JH-526A	77137	Shut - Oil Tube	1
2JH-510A	220004	Plug - Drain	2	2JH-527A	77137	Shut - Oil Tube	1
2JH-511A	214384	Shut - Compression	1	2JH-528A	214380	Shut - Compression	1
2JH-512A	214384	Shut - Compression	1	2JH-529A	214380	Shut - Compression	1
2JH-513A	214380	Shut - Compression	1	2JH-530A	2018	Screw	4
2JH-514A	214380	Shut - Compression	1	2JH-531A	94227	Pin - Lubricator	1
2JH-515A	77137	Shut - Oil Tube	1	2JH-532A	77137	Shut - Oil Tube	1
2JH-516A	77137	Shut - Oil Tube	1	2JH-533A	77137	Shut - Oil Tube	1
2JH-517A	214380	Shut - Compression	1	2JH-534A	77137	Shut - Oil Tube	1
2JH-518A	214380	Shut - Compression	1	2JH-535A	77137	Shut - Oil Tube	1
2JH-519A	214380	Shut - Compression	1	2JH-536A	77137	Shut - Oil Tube	1
2JH-520A	214380	Shut - Compression	1	2JH-537A	77137	Shut - Oil Tube	1
2JH-521A	214380	Shut - Compression	1				

SADDLE-TABLE LUBRICATION 2MI AND 2ML UNIVERSAL

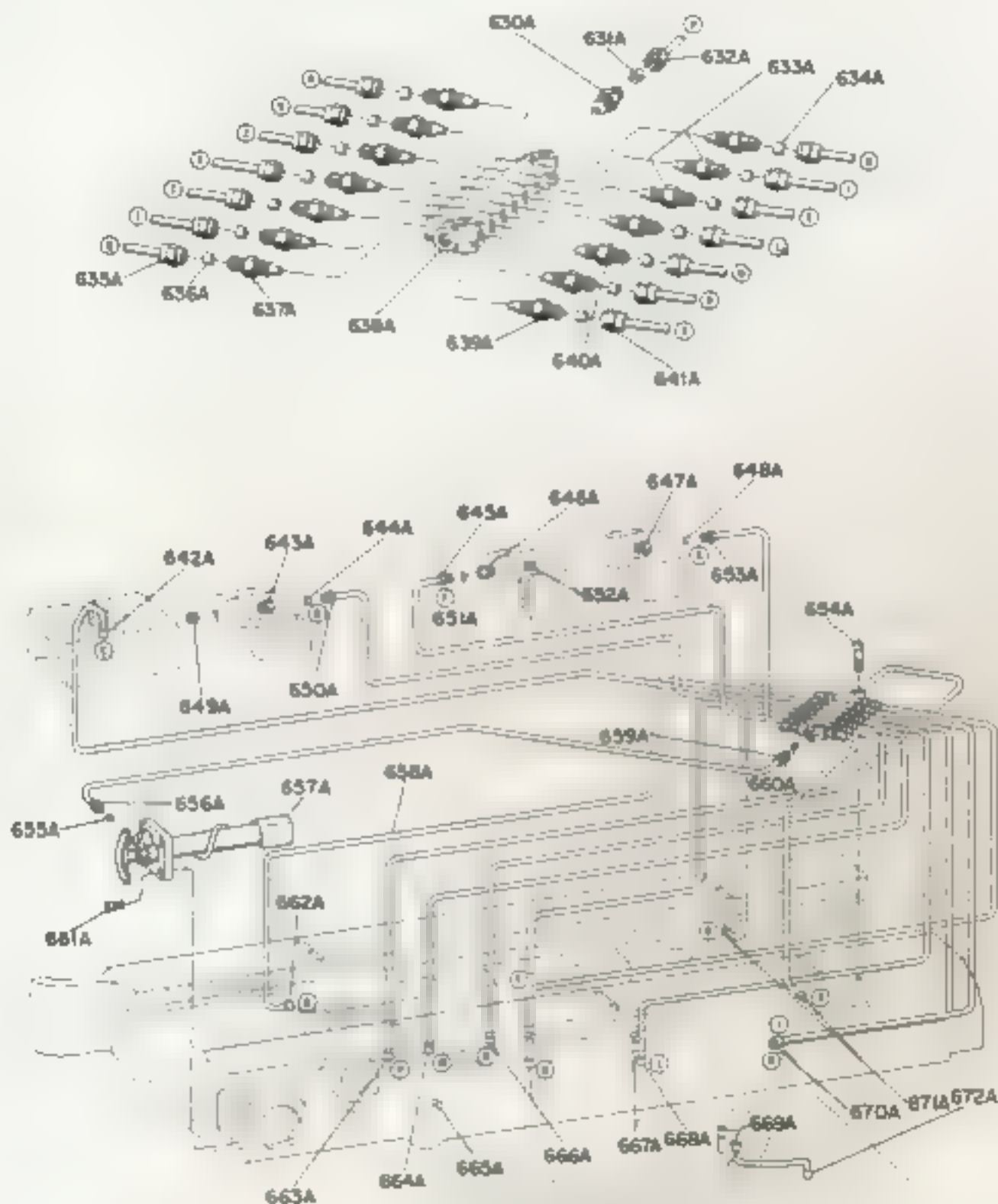


WHEN ORDERING PARTS, give key number, part name and part number. Be sure to get complete serial number for your machine. For complete instructions see Page 13 "How to Order Repair Parts."

2.46 UNIVERSAL MACHINES

Qty No	Part No	Part Name	Assy Count	Qty No	Part No	Part Name	Assy Count
21N-430A	210004	Flng - Crp	1	21N-431A	98844	Flng - Flst	1
21N-431A	214304	Scrv - Compression	1	21N-432A	214300	Shck - Compression	1
21N-432A	214304	Shp - Compression	1	21N-433A	2301	Scrv	1
21N-433A	21104	Flng - Crp	1	21N-434A	214304	Scrv - Compression	1
21N-434A	214304	Scrv - Compression	1	21N-435A	214304	Shck - Compression	1
21N-435A	214304	Shck - Compression	1	21N-436A	86257	Ptng - Lubricant	1
21N-436A	214304	Scrv - Compression	1	21N-437A	212004	Tubng Lgt	1
21N-437A	210004	Flng - Crp	1	21N-438A	214300	Shck - Compression	1
21N-438A	98187	Scrv	1	21N-439A	214304	Scrv - Compression	1
21N-439A	210004	Flng - Crp	1	21N-440A	2214	Scrv	1
21N-440A	21104	Flng - Crp	1	21N-441A	21107	Shck - Oil Tube	1
21N-441A	21104	Shck - Compression	1	21N-442A	21107	Shck - Oil Tube	1
21N-442A	21107	Shck - Oil Tube	1	21N-443A	21107	Shck - Oil Tube	1
21N-443A	214307	Adpstr - Straight	1	21N-444A	1444	Flng	1
21N-444A	214304	Scrv - Compression	1	21N-445A	21107	Shck - Oil Tube	1
21N-445A	214300	Shck - Compression	1	21N-446A	1444	Flng	1
21N-446A	214307	Adpstr - Straight	1	21N-447A	21107	Shck - Oil Tube	1
21N-447A	214307	Adpstr - Straight	1	21N-448A	2257	Shck - Oil Tube	1
21N-448A	214304	Scrv - Compression	1	21N-449A	21107	Shck - Oil Tube	1
21N-449A	1444	Flng - Flst	1	21N-450A	21107	Scrv - Oil Tube	1
21N-450A	214300	Shck - Compression	1	21N-451A	2257	Shck - Oil Tube	1
21N-451A	214300	Shck - Compression	1				

SADDLE-TABLE LUBRICATION 3MI UNIVERSAL

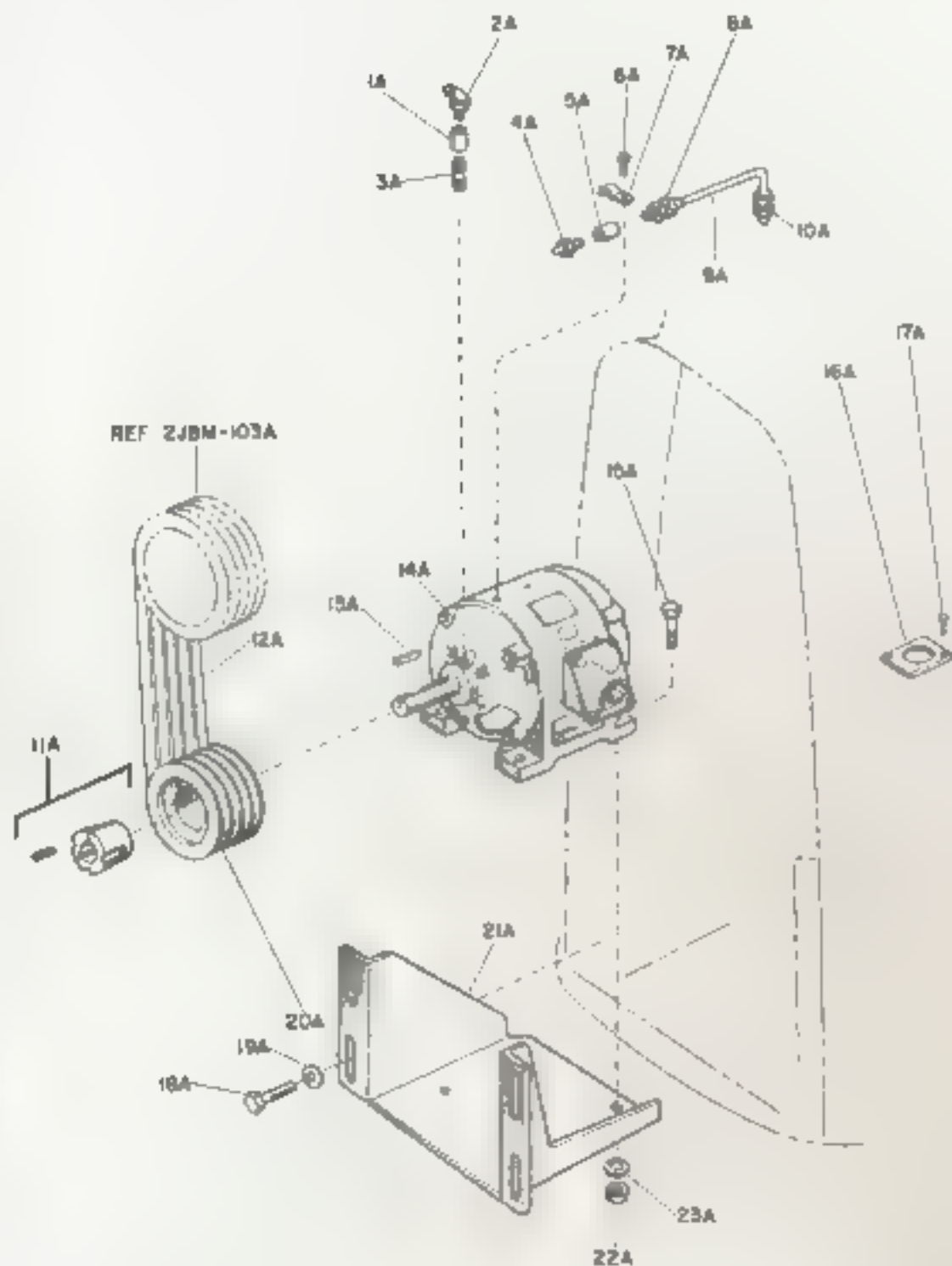


WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 39, "How to Order Repair Parts."

244 AND 244L UNIVERSAL MACHINES

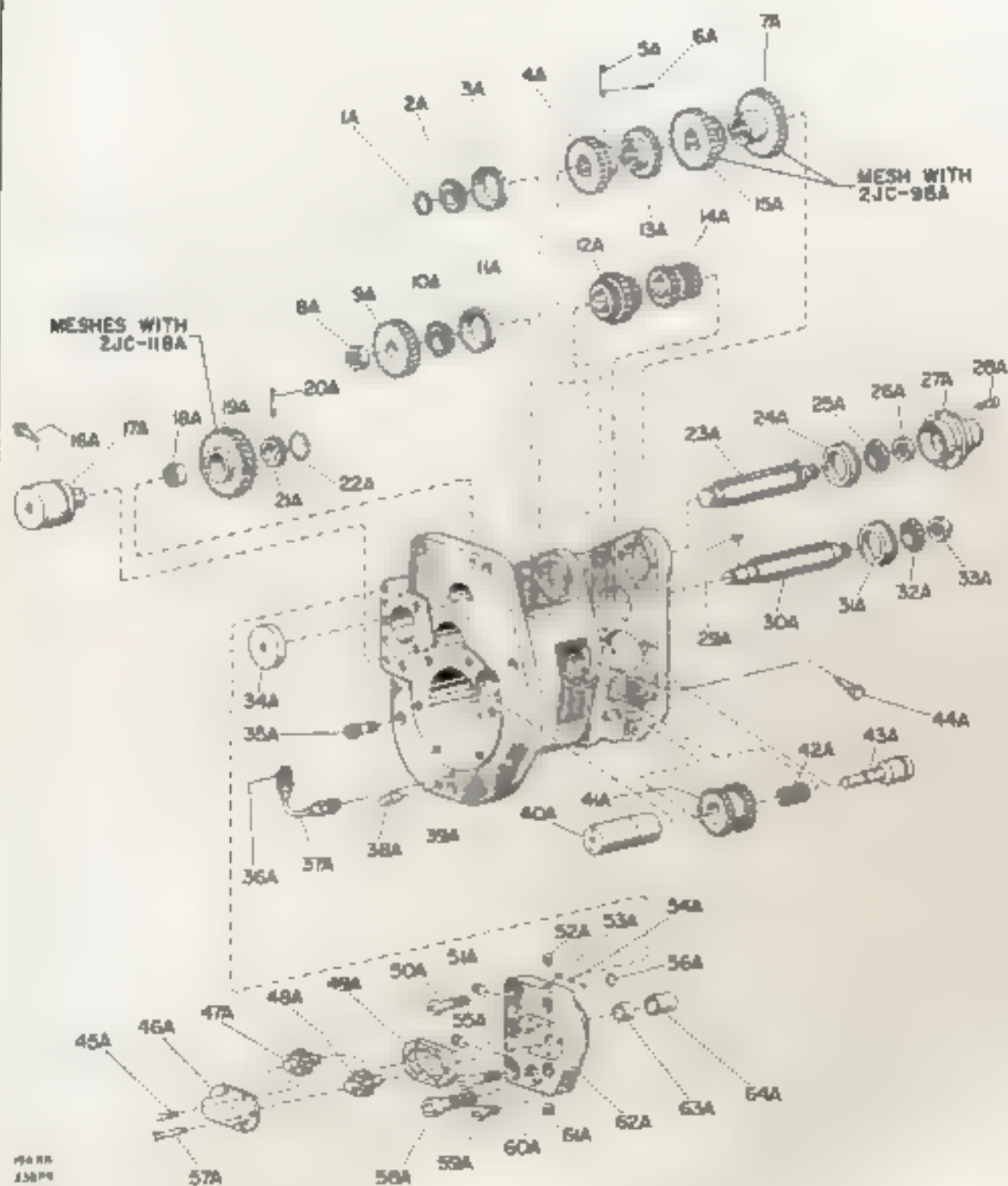
103

MOTOR DRIVE



11 R/R
13 R/R
15 R/R
16 R/R

DRIVE BRACKET



CINCINNATI NOS. 2 ML, 3 ML AND 3 ML MILKING MACHINES

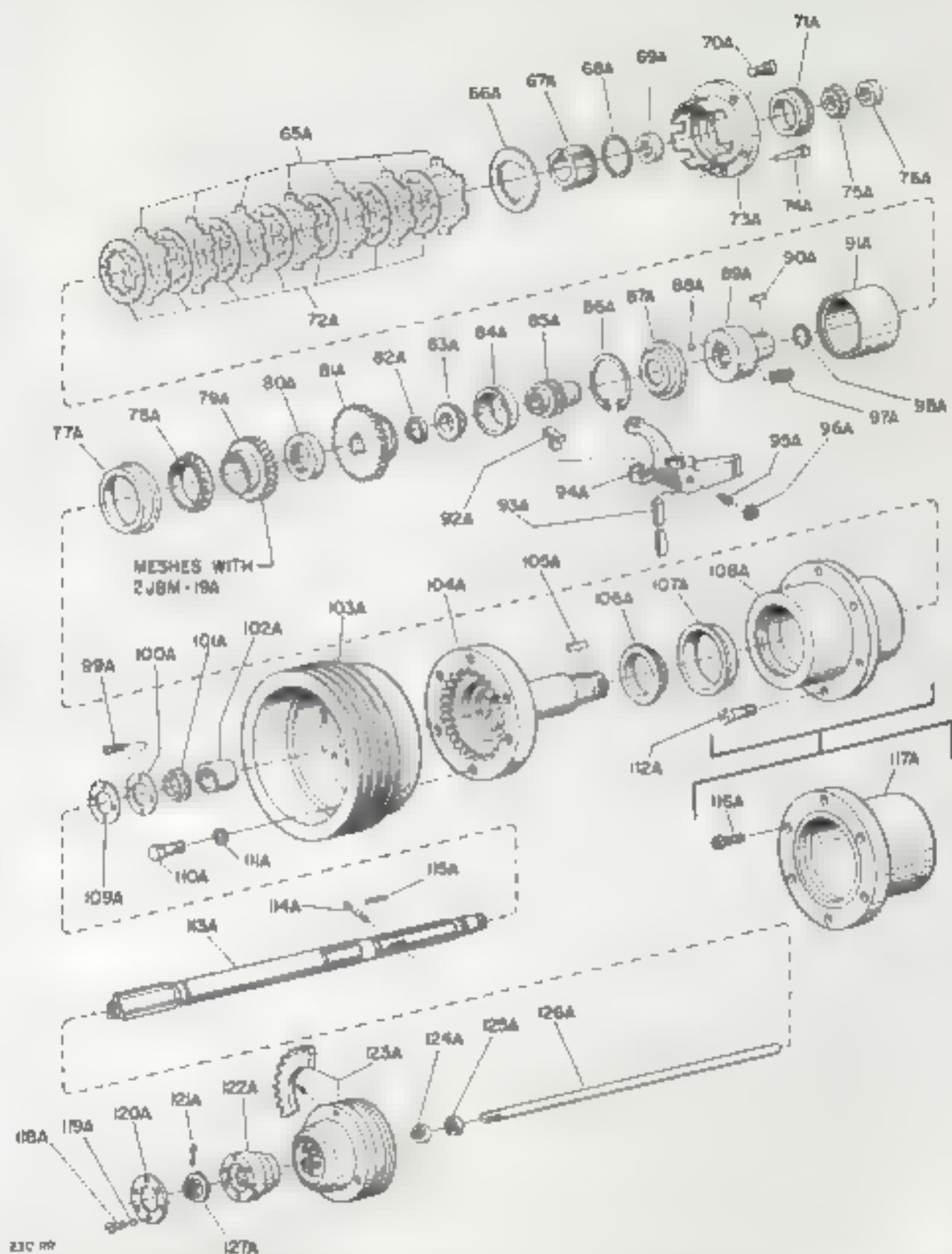
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 99, "How to Order Repair Parts."

DRIVE BRACKET — UNIT No. 2JBM

3ML, 2ML AND 3ML PLAIN AND UNIVERSAL
2ML VERTICAL

Key No.	Part No.	Part Name	Key No.	Part No.	Part Name	Key No.
2JBM-1A	111540	Ring - Retaining	2	2JBM-34A	Pin -	1
2JBM-2A	88333	Cone - Retaining	3	2JBM-35A	Pin -	1
2JBM-3A	95834	Cup - Bearing	4	2JBM-36A	Pin -	1
2JBM-4A	123474	Gear - Primary Change - 30T	5	2JBM-37A	Pin -	1
2JBM-5A	83810	Pin - Straight	6	2JBM-38A	Pin -	1
2JBM-6A	83810	Pin - Curved	7	2JBM-39A	Pin -	1
2JBM-7A	133443	Gear - Change - 44T	8	2JBM-40A	Pin -	1
2JBM-8A	4184	Pin - Lock	9	2JBM-41A	Pin -	1
2JBM-9A	111082	Gear - Drive	10	2JBM-42A	Pin -	1
	111082	Standard Series (25-1500)	11	2JBM-43A	Pin -	1
	111082	Low Series (25-1500)	12	2JBM-44A	Pin -	1
	111081	High Series (25-1500)	13	2JBM-45A	Pin -	1
2JBM-10A	111041	Cone - Bearing	14	2JBM-46A	Pin -	1
2JBM-11A	111040	Cup - Bearing	15	2JBM-47A	Pin -	1
2JBM-12A	133443	Gear - Cluster - 30T and 32T	16	2JBM-48A	Pin -	1
2JBM-13A	133443	Gear - Primary Change - 30T	17	2JBM-49A	Pin -	1
2JBM-14A	133443	Gear - Cluster - 30T and 32T	18	2JBM-50A	Pin -	1
2JBM-15A	133443	Gear - Cluster - 32T and 30T	19	2JBM-51A	Pin -	1
2JBM-16A	14150	Pin - Taper	20	2JBM-52A	Pin -	1
2JBM-17A	14150	Pin - Drive Miller Gear	21	2JBM-53A	Pin -	1
2JBM-18A	130333	Bearing - Needle	22	2JBM-54A	Pin -	1
2JBM-19A	14150	Gear - Drive Miller	23	2JBM-55A	Pin -	1
2JBM-20A	124812	Pin - Straight	24	2JBM-56A	Pin -	1
2JBM-21A	141544	Collar - Drive Miller	25	2JBM-57A	Pin -	1
2JBM-22A	74424	Spring - Locking	26	2JBM-58A	Pin -	1
2JBM-23A	111118	Pin - Secondary Change Gear	27	2JBM-59A	Pin -	1
2JBM-24A	95834	Cup - Bearing	28	2JBM-60A	Pin -	1
2JBM-25A	88333	Cone - Retaining	29	2JBM-61A	Pin -	1
2JBM-26A	4184	Pin - Lock	30	2JBM-62A	Pin -	1
2JBM-27A	130421	Pin - Drive Miller	31	2JBM-63A	Pin -	1
2JBM-28A	1304	Pin -	32	2JBM-64A	Pin -	1
2JBM-29A	1304	Pin -	33	2JBM-65A	Pin -	1
2JBM-30A	111081	Pin - Primary	34	2JBM-66A	Pin -	1
2JBM-31A	95834	Cup - Bearing	35	2JBM-67A	Pin -	1
2JBM-32A	88333	Cone - Retaining	36	2JBM-68A	Pin -	1
2JBM-33A	4184	Pin - Lock	37	2JBM-69A	Pin -	1

CLUTCH



CINCINNATI NOS 2 M, 2 M1 AND 3 M1 MILLING MACHINES

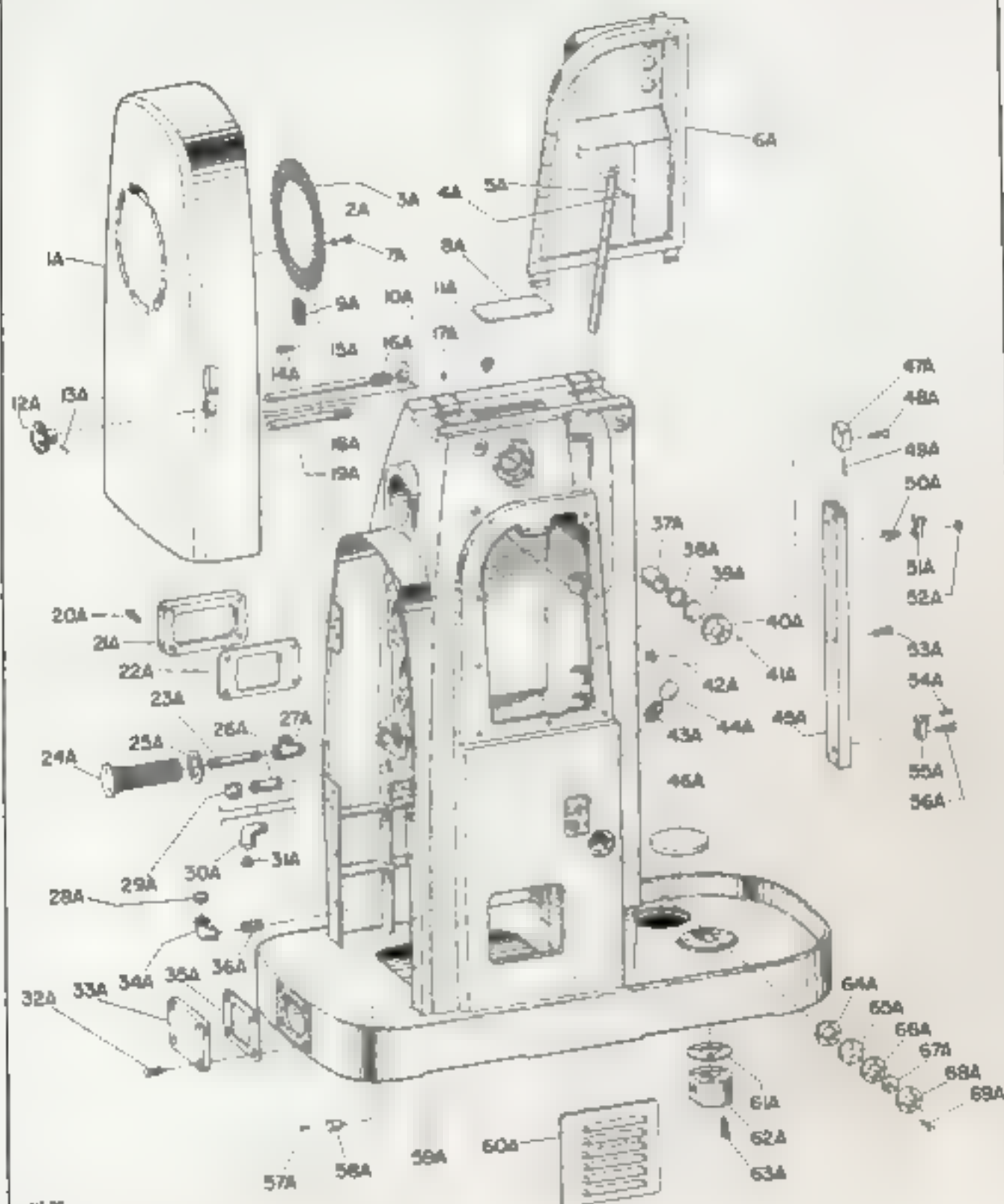
WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 59. How to Order Repair Parts.

DRIVE BRACKET — UNIT No. 2JEM (Concluded)

2M, 2M1 AND 3M1 PLAIN AND UNIVERSAL
2M1 VERTICAL

Key No.	Part No.	Part Name	Unit Used	Key No.	Part No.	Part Name	Unit Used
2JEM-88A	110443	Plate - Driving	1	2JEM-101A	124431	Bushing - Drive Shaft	1
2JEM-88A	110444	Plate - Pressure - Brake	1	2JEM-101A	124432	Shafts - Drive	1
2JEM-87A	110442	Sub - Brake Plates	1	110474	2M1 Plate and Universal Machines	1	
2JEM-88A	110481	Ring - Retaining	1	110475	2M1 Vertical Machines - Model Fr 750	1	
2JEM-88A	110482	Ring - Lock	1	110476	2M1 Vertical Machines - Model Fr 1000	1	
2JEM-78A	110483	Spring	1	110477	2M1 Machines	1	
2JEM-78A	110478	Cup - Bearing	1	110478	2M1 Machines	1	
2JEM-72A	110484	Plate - Drive	1	110479	2M1 Machines	1	
2JEM-72A	110485	Washer - Brake Plates	1	110480	2M1 Machines	1	
2JEM-74A	110486	Pin - Taper	1	110481	2M1 Machines	1	
2JEM-74A	110487	Cone - Bearing	1	110482	2M1 Machines	1	
2JEM-74A	110488	Pin - Lock	1	110483	2M1 Machines	1	
2JEM-74A	110489	Cup - Bearing	1	110484	2M1 Machines	1	
2JEM-74A	110490	Cone - Bearing	1	110485	2M1 Machines	1	
2JEM-74A	110491	Cap	1	110486	2M1 Machines	1	
2JEM-80A	110492	Sub - Lock	1	110487	2M1 Machines	1	
2JEM-81A	110493	Gear - Spindle Drive	1	110488	2M1 Machines	1	
110494	Handers Series 115-1000	1	110489	2M1 Machines	1		
110495	Lee Series 110-1000	1	110490	2M1 Machines	1		
110496	Walt Series 112-1000	1	110491	2M1 Machines	1		
2JEM-87A	110497	Washer - Thrust	1	110492	2M1 Machines	1	
2JEM-87A	110498	Cone - Bearing	1	110493	2M1 Machines	1	
2JEM-87A	110499	Cup - Bearing	1	110494	2M1 Machines	1	
2JEM-88A	110500	Ring - Retaining	1	110495	2M1 Machines	1	
2JEM-87A	110501	Plate - Brake Ball	1	110496	2M1 Machines	1	
2JEM-88A	110502	Ball - Steel	1	110497	2M1 Machines	1	
2JEM-88A	110503	Ball - Steel	1	110498	2M1 Machines	1	
2JEM-88A	110504	Ball - Steel	1	110499	2M1 Machines	1	
2JEM-88A	110505	Ball - Steel	1	110500	2M1 Machines	1	
2JEM-88A	110506	Ball - Steel	1	110501	2M1 Machines	1	
2JEM-88A	110507	Ball - Steel	1	110502	2M1 Machines	1	
2JEM-88A	110508	Ball - Steel	1	110503	2M1 Machines	1	
2JEM-88A	110509	Ball - Steel	1	110504	2M1 Machines	1	
2JEM-88A	110510	Ball - Steel	1	110505	2M1 Machines	1	
2JEM-88A	110511	Ball - Steel	1	110506	2M1 Machines	1	
2JEM-88A	110512	Ball - Steel	1	110507	2M1 Machines	1	
2JEM-88A	110513	Ball - Steel	1	110508	2M1 Machines	1	
2JEM-88A	110514	Ball - Steel	1	110509	2M1 Machines	1	
2JEM-88A	110515	Ball - Steel	1	110510	2M1 Machines	1	
2JEM-88A	110516	Ball - Steel	1	110511	2M1 Machines	1	
2JEM-88A	110517	Ball - Steel	1	110512	2M1 Machines	1	
2JEM-88A	110518	Ball - Steel	1	110513	2M1 Machines	1	
2JEM-88A	110519	Ball - Steel	1	110514	2M1 Machines	1	
2JEM-88A	110520	Ball - Steel	1	110515	2M1 Machines	1	
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2JEM-88A	110536	Ball - Steel	1	110531	2M1 Machines	1	
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2JEM-88A	110538	Ball - Steel	1	110533	2M1 Machines	1	
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2JEM-88A	110540	Ball - Steel	1	110535	2M1 Machines	1	
2JEM-88A	110541	Ball - Steel	1	110536	2M1 Machines	1	
2JEM-88A	110542	Ball - Steel	1	110537	2M1 Machines	1	
2JEM-88A	110543	Ball - Steel	1	110538	2M1 Machines	1	
2JEM-88A	110544	Ball - Steel	1	110539	2M1 Machines	1	
2JEM-88A	110545	Ball - Steel	1	110540	2M1 Machines	1	
2JEM-88A	110546	Ball - Steel	1	110541	2M1 Machines	1	
2JEM-88A	110547	Ball - Steel	1	110542	2M1 Machines	1	
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2JEM-88A	110567	Ball - Steel	1	110562	2M1 Machines	1	
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2JEM-88A	110570	Ball - Steel	1	110565	2M1 Machines	1	
2JEM-88A	110571	Ball - Steel	1	110566	2M1 Machines	1	
2JEM-88A	110572	Ball - Steel	1	110567	2M1 Machines	1	
2JEM-88A	110573	Ball - Steel	1	110568	2M1 Machines	1	
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2JEM-88A	110576	Ball - Steel	1	110571	2M1 Machines	1	
2JEM-88A	110577	Ball - Steel	1	110572	2M1 Machines	1	
2JEM-88A	110578	Ball - Steel	1	110573	2M1 Machines	1	
2JEM-88A	110579	Ball - Steel	1	110574	2M1 Machines	1	
2JEM-88A	110580	Ball - Steel	1	110575	2M1 Machines	1	
2JEM-88A	110581	Ball - Steel	1	110576	2M1 Machines	1	
2JEM-88A	110582	Ball - Steel	1	110577	2M1 Machines	1	
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2JEM-88A	110610	Ball - Steel	1	110605	2M1 Machines	1	
2JEM-88A	110611	Ball - Steel	1	110606	2M1 Machines	1	
2JEM-88A	110612	Ball - Steel	1	110607	2M1 Machines	1	
2JEM-88A	110613	Ball - Steel	1	110608	2M1 Machines	1	
2JEM-88A	110614	Ball - Steel	1	110609	2M1 Machines	1	
2JEM-88A	110615	Ball - Steel	1	110610	2M1 Machines	1	
2JEM-88A	110616	Ball - Steel	1	110611	2M1 Machines	1	
2JEM-88A	110617	Ball - Steel	1	110612	2M1 Machines	1	
2JEM-88A	110618	Ball - Steel	1	110613	2M1 Machines	1	
2JEM-88A	110619	Ball - Steel	1	110614	2M1 Machines	1	
2JEM-88A	110620	Ball - Steel	1	110615	2M1 Machines	1	
2JEM-88A	110621	Ball - Steel	1	110616	2M1 Machines	1	
2JEM-88A	110622	Ball - Steel	1	110617	2M1 Machines	1	
2JEM-88A	110623	Ball - Steel	1	110618	2M1 Machines	1	
2JEM-88A	110624	Ball - Steel	1	110619	2M1 Machines	1	
2JEM-88A	110625	Ball - Steel	1	110620	2M1 Machines	1	
2JEM-88A	110626	Ball - Steel	1	110621	2M1 Machines	1	
2JEM-88A	110627	Ball - Steel	1	110622	2M1 Machines	1	
2JEM-88A	110628	Ball - Steel	1	110623	2M1 Machines	1	
2JEM-88A	110629	Ball - Steel	1	110624	2M1 Machines	1	
2JEM-88A	110630	Ball - Steel	1	110625	2M1 Machines	1	
2JEM-88A	110631	Ball - Steel	1	110626	2M1 Machines	1	
2JEM-88A	110632	Ball - Steel	1	110627	2M1 Machines	1	
2JEM-88A	110633	Ball - Steel	1	110628	2M1 Machines	1	
2JEM-88A	110634	Ball - Steel	1	110629	2M1 Machines	1	
2JEM-88A	110635	Ball - Steel	1	110630	2M1 Machines	1	
2JEM-88A	110636	Ball - Steel	1	110631	2M1 Machines	1	
2JEM-88A	110637	Ball - Steel	1	110632	2M1 Machines	1	
2JEM-88A	110638	Ball - Steel	1	110633	2M1 Machines	1	
2JEM-88A	110639	Ball - Steel	1	110634	2M1 Machines	1	
2JEM-88A	110640	Ball - Steel	1	110635	2M1 Machines	1	
2JEM-88A	110641	Ball - Steel	1	110636	2M1 Machines	1	
2JEM-88A	110642	Ball - Steel	1	110637	2M1 Machines	1	
2JEM-88A	110643	Ball - Steel	1	110638	2M1 Machines	1	
2JEM-88A	110644	Ball - Steel	1	110639	2M1 Machines	1	
2JEM-88A	110645	Ball - Steel	1	110640	2M1 Machines	1	
2JEM-88A	110646	Ball - Steel	1	110641	2M1 Machines	1	
2JEM-88A	110647	Ball - Steel	1	110642	2M1 Machines	1	
2JEM-88A	110648	Ball - Steel	1	110643	2M1 Machines	1	
2JEM-88A	110649	Ball - Steel	1	110644	2M1 Machines	1	
2JEM-88A	110650	Ball - Steel	1	110645			

COLUMN AND COVERS



42 88
508 88
509 88

CINCINNATI NOS 2 ML, 2 W AND 3 W MILLING MACHINES

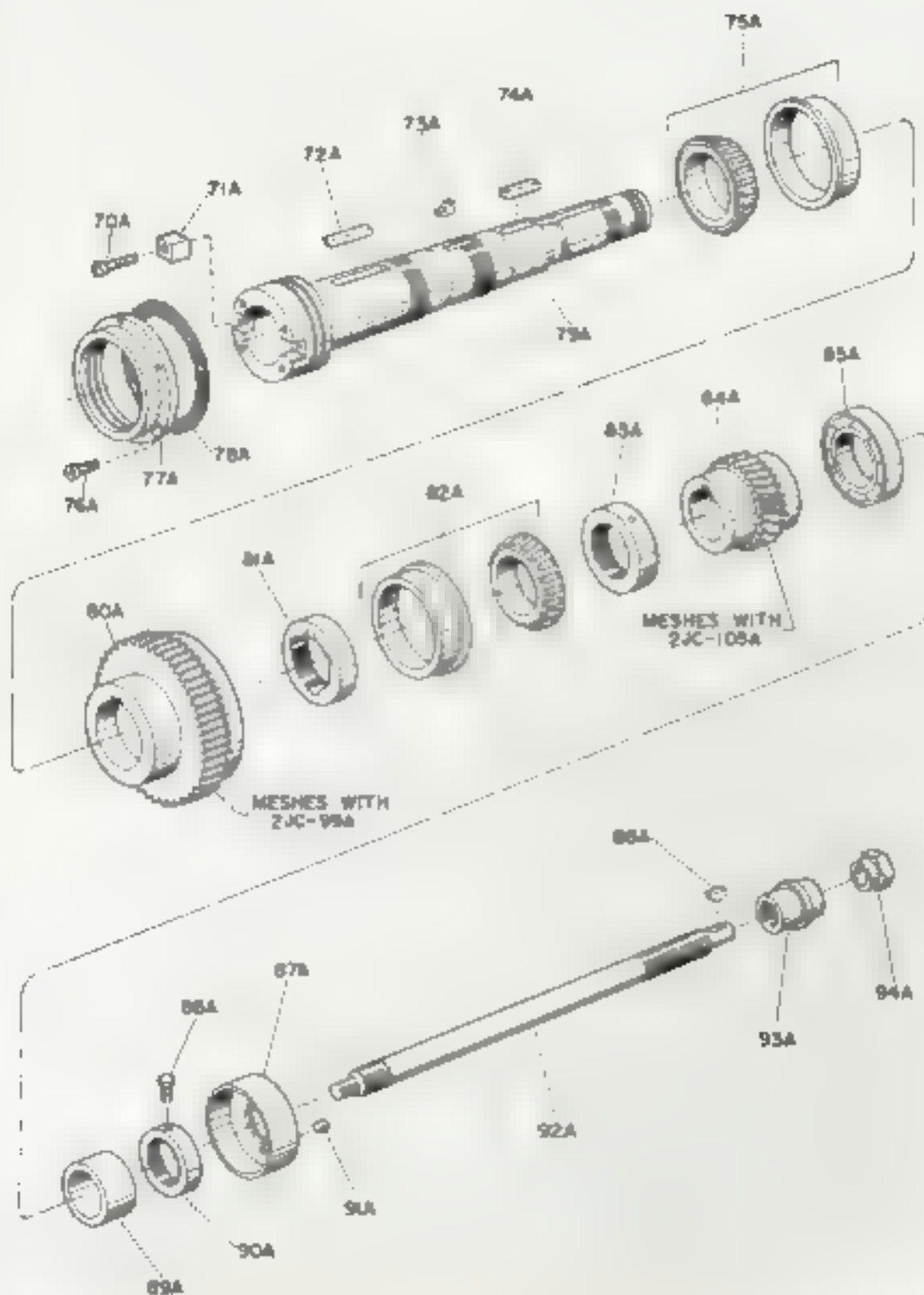
WHEN ORDERING PARTS, Give Key Number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 77, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC

2ML, 2W AND 3W PLAIN AND UNIVERSAL 3W VERTICAL

Key No	Part No.	Part Name	Am't. Used	Key No	Part No.	Part Name	Am't. Used
2JC-1A		Cover - Column - Rear		2JC-24A	13814	Elbow - Pipe	1
	14032E	2ML Machines - With Lat. & Type Lock	1	2JC-24A	13903T	Gasket - Sump	1
	14034E	2ML Machines - With Screw Type Lock	1	2JC-24A	14413	nipple - Pipe	1
	14035E	2ML Machines - With Lat. & Type Lock	1	2JC-24A		Body - Oil Gage	1
	14037E	2ML Machines - With Screw Type Lock	1	10874X		Plain and Universal Machines	1
	14039E	2ML Machines - With Lat. & Type Lock	1	13515		Vertical Machines	1
	14040E	2ML Machines - With Screw Type Lock	1	2JC-24A	14413	Gasket - Oil Gage	1
2JC-2A	10890E	Washer	1	2JC-24A	14413	Dip - Oil Gage	1
2JC-3A		Seal - Cover		2JC-24A	14413	Cover - Oil Gage	1
	11841E	2ML, 2W, Machines	1	2JC-24A	14413	Screw	1
	12014E	2W Machines	1	2JC-24A	14413	Plug	1
2JC-4A	14038	Screw	15	2JC-24A	14413	Spoke - Pipe	1
2JC-5A	14039	Washer	1	2JC-24A	14413	Cap - Oil Filler	1
2JC-6A		Cover - Electrical Connections		2JC-24A		Bar - Top Bar	1
	14035E	2ML, 2W, Plain and Universal Machines	1		11840E	2ML Plain and Universal Machines	1
	14035E	2W Vertical Machines	1		11837E	2ML Plain and Universal, 2W Vertical Machines	1
	14037E	2W Machines	1			2ML Machines	1
2JC-7A	14038	Screw	1		11840E	2ML Machines	1
2JC-8A	14039	Cover - Column Top (2ML and Universal Machines Only)	1	2JC-24A	14413	Cover - Base (Without Coolant Pump)	1
	11873E	Washer - Rear Column Cover	1	2JC-24A	14413	Block - Base Stop	1
2JC-9A	14038	Lat. - Rear Column Cover	1	2JC-24A	14413	Screw	1
2JC-10A	21033	Quench - Refueling	1		14413	Pin - Stop	1
2JC-11A		Knob - Center			14413	2ML, 2W, Plain, 2W Vertical Machines	1
	10143E	With Lat. Type Lock	1		14413	2W Vertical Machines	1
	10143E	With Screw Type Lock	1	2JC-24A	14413	Block - Top	1
2JC-12A	14038	Pin - Stop	1	2JC-24A	14413	Dog - Vertical Trip	1
2JC-13A	14038	Screw	15	2JC-24A	14413	Pin - Stop	1
2JC-14A		Knob - Lat. Lock		2JC-24A	14413	Pin - Taper	1
2JC-15A	14039	2ML Machines (With Lat. & Type Lock)	1	2JC-24A	14413	Dog - Positive Stop	1
	14039	2ML Machines (With Lat. & Type Lock)	1	2JC-24A	14413	Screw	1
	14039	2W Machines (With Lat. Type Lock)	1	2JC-24A	14413	Screw	1
2JC-16A	14038	Spring - Lat. Lock (With Lat. Type Lock)	1	2JC-24A	14413	Pin - Lat. Lock	1
2JC-17A	21171	Pin - Plain and Universal Machines Only	1	2JC-24A		Column	
2JC-18A	14038	Pin - Taper (With Lat. Type Lock)	1		14038	2ML Plain and Universal With Auto Table Cycle	1
2JC-19A		Block - Lock			14038	2ML Plain and Universal With Auto Table Cycle	1
	14038	2ML, 2W Machines (With Screw Type Lock)	1		14038	2W Vertical Without Auto Table Cycle	1
	14038	2ML Machines (With Screw Type Lock)	1		14038	2W Vertical With Auto Table Cycle	1
2JC-20A	14038	Screw (Without Coolant Pump)	1		14038	2ML Machines Without Auto Table Cycle	1
2JC-21A	14038	Cover - Coolant Sump - Without Coolant Pump	1		14038	2ML Machines With Auto Table Cycle	1
2JC-22A	11811	Gasket - Sump (Without Coolant Pump)	1		14038	2W Vertical Without Auto Table Cycle	1
2JC-23A	11811	Pin - Lat.	1	2JC-24A	14413	2ML Machines With Auto Table Cycle	1
2JC-24A	14038	Straight	1		14038	2W Vertical Without Auto Table Cycle	1
2JC-25A	14038	Gasket	1		14038	2ML Machines With Auto Table Cycle	1
2JC-26A	14038	Spoke - Pipe (Plain and Universal)	1		14038	2W Vertical Without Auto Table Cycle	1
		Machines Only			14038	2ML Machines With Auto Table Cycle	1
2JC-27A	14038	Pin - Service	1	2JC-24A	14413	Lower - Column	1
2JC-28A	14038	Pin - Oil Filler	1	2JC-24A	14413	2ML, 2W, Machines	1
2JC-29A	14038	Cap - Pipe (Plain and Universal Machines Only)	1	2JC-24A	14413	2ML Machines	1
		Only		2JC-24A	14413	Gasket - Sump	1
2JC-30A	14038	Elbow - Sump (Vertical Machines Only)	1	2JC-24A	14413	Sump - Draining Screw	1
2JC-31A	14038	Pin - Pipe (Vertical Machines Only)	1	2JC-24A	14413	Screw	1
2JC-32A	14038	Screw	1	2JC-24A	14413	Gasket - Oil Gage	1
2JC-33A	14038	Cover - Coolant Sump	1	2JC-24A	14413	Dip - Oil Gage	1
				2JC-24A	14413	Cover - Oil Gage	1
				2JC-24A	14413	Screw	1

HORIZONTAL SPINDLE



15000
20000

CINCINNATI NOS 2 ML, 2 MI AND 3 MI MILUNG MACHINES

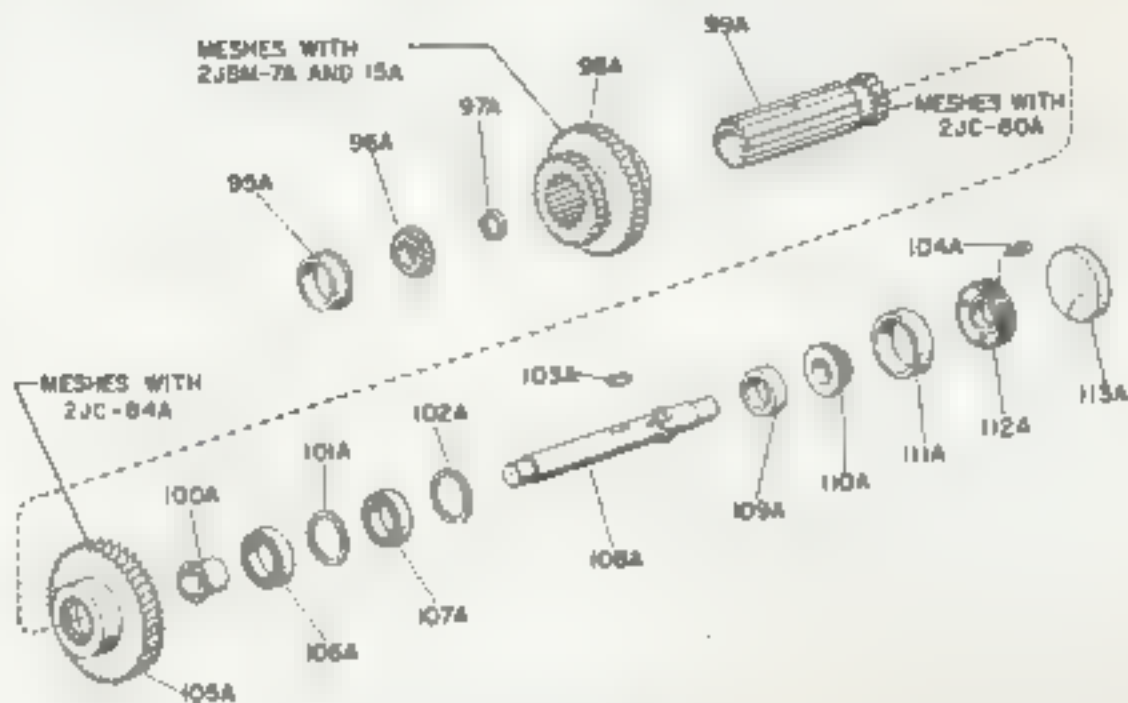
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

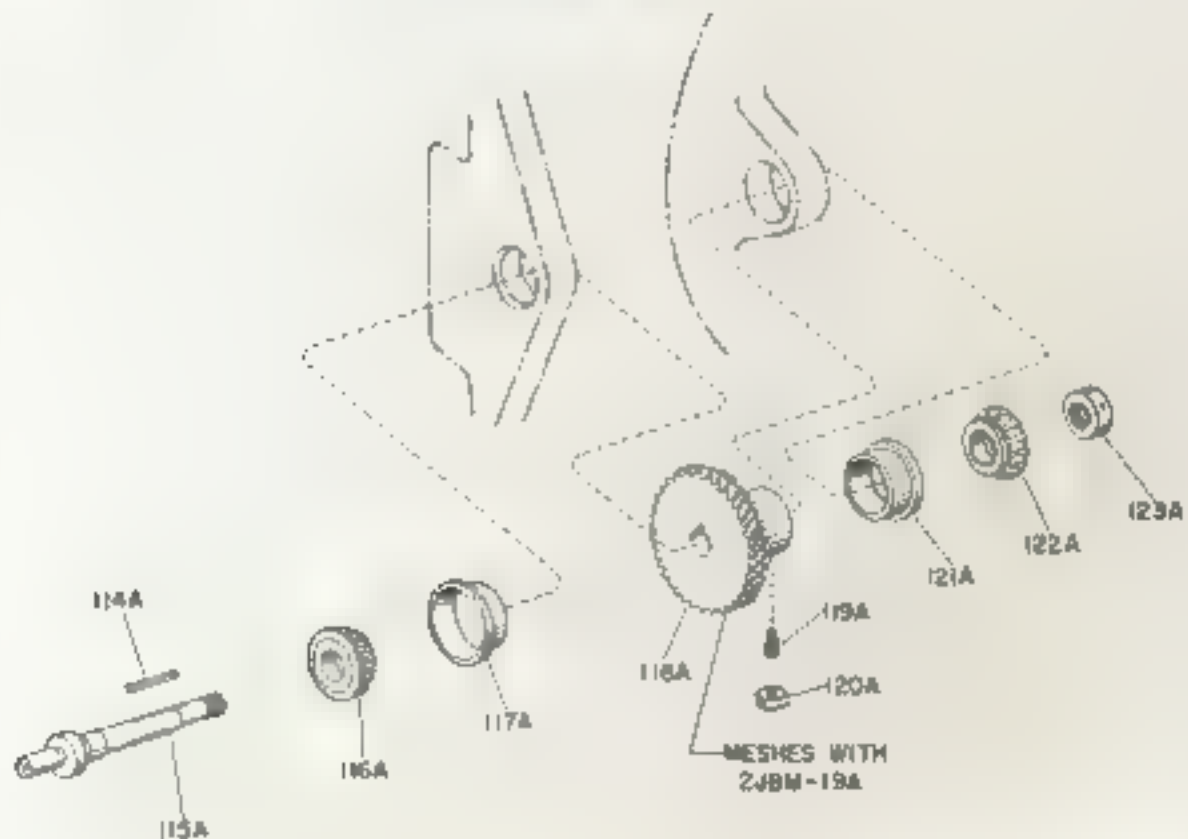
PLAIN AND UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Am't. Used	Key No.	Part No.	Part Name	Am't. Used
2JC-Y0A	1188	Screw - Bladed Head	2	2JC-03A	21874	Nut - Lock	1
2JC-Y1A	3897	Key - Arbor Drive	2	2JC-04A	11593	Gear - Spindle	1
2JC-Y2A	111813	Key - Spindle	1	2JC-05A	97813	Bearing - Ball	1
2JC-Y3A	9304	Key - Bearing Lock	1	2JC-06A	115333	Screw - Set	1
2JC-Y4A	2448	Key	1	2JC-07A	108715	Cap - Spindle Bearing	1
2JC-Y5A	111048	Bearing - Precision	1	2JC-08A	1890	Key - Woodruff	1
2JC-Y6A	3388	Screw	6	2JC-09A	111847	Spacer - Spindle - Rear	2
2JC-Y7A	114325	Cap - Front Spindle	1	2JC-10A	228333	Nut - Lock	1
2JC-Y8A	114323	Gasket - Spindle Cap	1	2JC-11A	1715	Screw - Set	1
2JC-Y9A		Spindle		2JC-02A		Roll - Arbor Drive	
	118411	2M2, 2M4 Machines	1		111894	Roll - 2M2 Machines	1
	128325	2M3 Machines	1		184217	2M2 Machines	1
2JC-00A	122447	Gear - Face	1	2JC-01A	2061	Nut - Arbor Drive Roll	1
2JC-01A	118413	Nut - Lock	1	2JC-04A	108713	Head - Drive Roll	1
2JC-02A	111048	Bearing - Precision	1				

BACK GEAR SHAFT



PUMP DRIVE SHAFT



CINCINNATI NOS 2 ML 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 17, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

PLAIN AND UNIVERSAL MACHINES

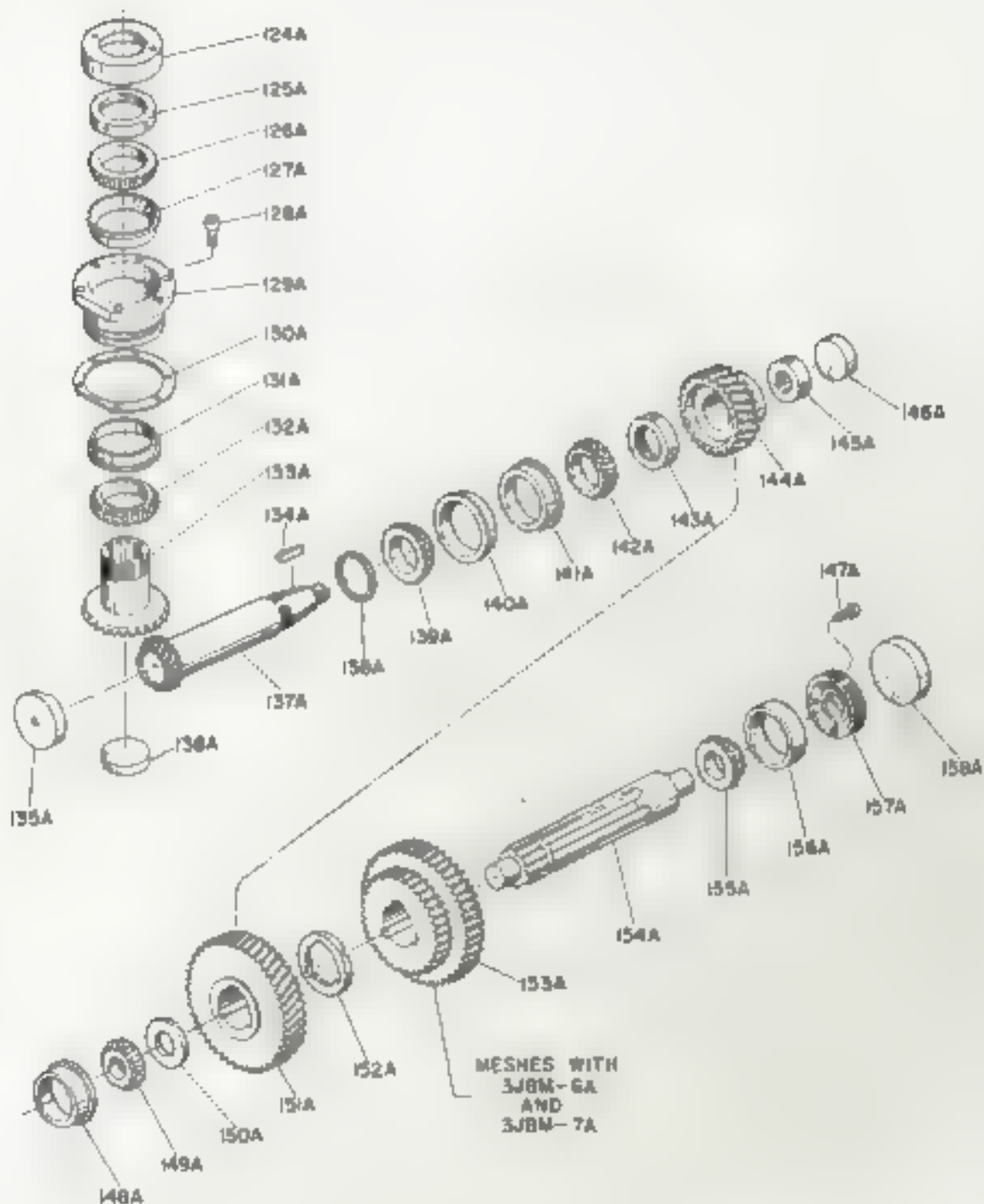
Key No	Part No.	Part Name	Amt. Used	Key No	Part No.	Part Name	Amt. Used
2JC-98A	111023	Cup - Bearing	1	2JC-103A	111031	Gear - Rack	1
2JC-98A	111028	Cone - Bearing	1	2JC-103A	111031	Bearing - Ball	1
2JC-97A	111043	Washer - Thrust	1	2JC-103A	111031	Bearing - Ball	1
2JC-98A	111046	Gear - Cutting Rack	1	2JC-103A	111031	Shell - Rack Gear	1
2JC-98A	111047	Gear - Rack Mating	1	2JC-103A	111031	Spacer - Rack Gear	1
2JC-101A	111048	Bushing	1	2JC-103A	111031	Cone - Bearing	1
2JC-101A	111048	Ring - Retaining	1	2JC-103A	111031	Cup - Bearing	1
2JC-103A	111048	Ring - Key	1	2JC-103A	111048	Nut - Lock	1
2JC-103A	111048	Key	1	2JC-103A	111048	Flag	1
2JC-103A	111048	Spacer - Set	1				

COLUMN — UNIT No. 2JC (Continued)

2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No	Part No.	Part Name	Amt. Used	Key No	Part No.	Part Name	Amt. Used
2JC-114A	111048	Key	1	2JC-114A	111048	Screen - Set	1
2JC-115A	111048	Shell - Pump Drive	1	2JC-115A	111048	Nut - Hex	1
2JC-115A	111048	Cone - Bearing	1	2JC-115A	111048	Cup - Bearing	1
2JC-117A	111048	Cup - Bearing	1	2JC-117A	111048	Cone - Bearing	1
2JC-118A	111048	Shell - Pump Drive	1	2JC-117A	111048	Nut - Lock	1

VERTICAL DRIVE SHAFTS



CINCINNATI NOS. 2 ML, 2 M AND 3 M MILLING MACHINES

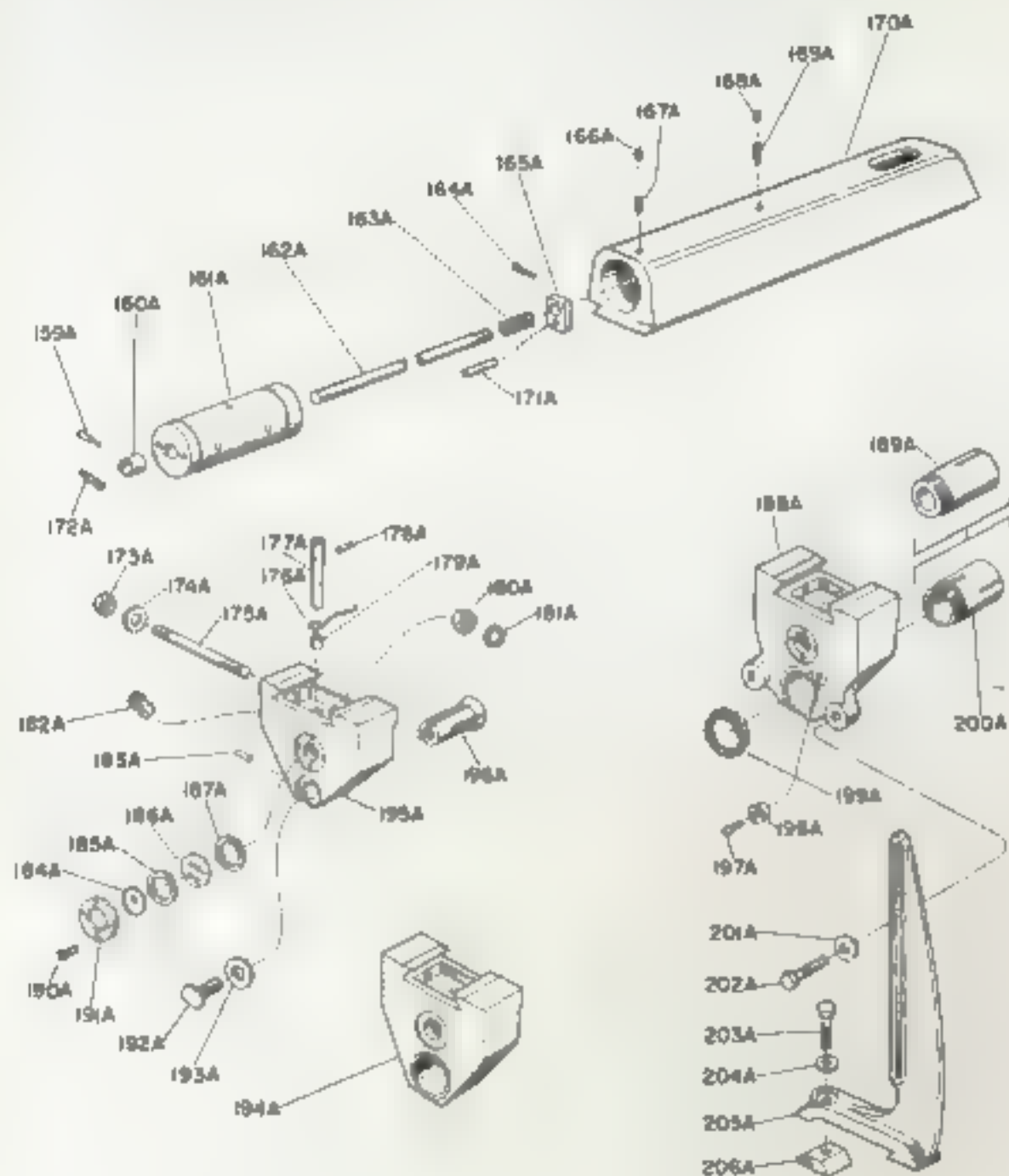
WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 39, "How to Order Repair Parts."

COLUMN -- UNIT No. 2JC (Continued)

3M VERTICAL MACHINES

Key No.	Part No.	Part Name	Am't Used	Key No.	Part No.	Part Name	Am't Used
2JC-124A	110384	Plug - Oil . . .	1	2JC-141A	111303	Cone - Bearing . . .	1
2JC-120A	110581	Nut - Lock . . .	1	2JC-141A	119785	Nut - Lock . . .	1
2JC-128A	110301	Cone - Bearing . . .	1	2JC-141A	120447	Gear - Drive . . .	1
2JC-127A	110301	Cup - Bearing . . .	1	2JC-141A	119874	Pin - Adjusting . . .	1
2JC-124A	3244	Screw . . .	4	2JC-141A	3531	Plug . . .	1
2JC-129A	110321	Washer - Bearing . . .	1	2JC-141A	3115	Screw . . .	1
2JC-129A	110371	Washer - Flaring . . .	1	2JC-141A	110372	Cup - Bearing . . .	1
2JC-131A	110302	Cup - Bearing . . .	1	2JC-141A	111426	Cone - Bearing . . .	1
2JC-132A	110302	Cone - Bearing . . .	1	2JC-141A	120871	Washer - Splining . . .	1
2JC-132A	110302	Gear - Spiral Bevel . . .	1	2JC-141A	120870	Gear - Drive . . .	1
2JC-134A	8448	Key . . .	1	2JC-141A	120871	Washer . . .	1
2JC-138A	110272	Plug - Flange . . .	1	2JC-141A	120871	Gear - Sliding Rack . . .	1
2JC-138A	3535	Plug . . .	1	2JC-141A	120872	Pin . . .	1
2JC-137A	120447	Pinion - Spiral Bevel Gear . . .	1	2JC-141A	111426	Cone - Bearing . . .	1
2JC-138A	110347	Washer - Flaring . . .	1	2JC-141A	111426	Cup - Bearing . . .	1
2JC-139A	110348	Cone - Bearing . . .	1	2JC-141A	111426	Pin - Adjusting . . .	1
2JC-140A	110304	Cup - Bearing . . .	1	2JC-141A	69442	Plug . . .	1
2JC-141A	110304	Cup - Bearing . . .	1				

OVERARM AND ARBOR SUPPORTS



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

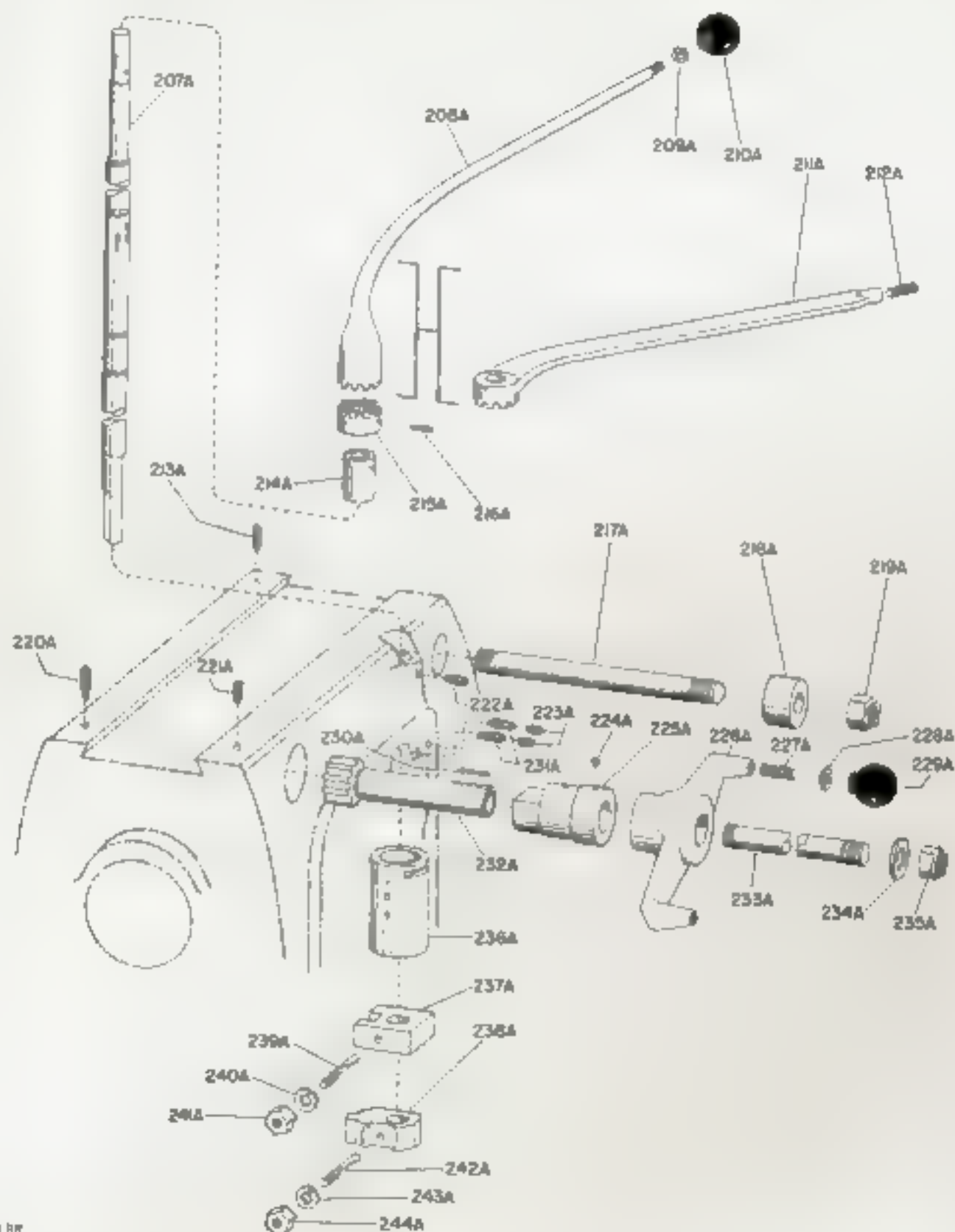
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

PLAIN AND UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Am't. Each	Key No.	Part No.	Part Name	Am't. Used	
2JC-100A	140	Pin - Taper	2	2JC-100A	800	Nut - Hex	1	
2JC-100A	120287	Collar - Rod	0	2JC-101A	12001	Washer	1	
2JC-101A	102212	Damper - Friction	2	2JC-102A	07004	Pin - Oil	1	
	102237	Oil, 2MI Machines	2	2JC-102A	2143	Pin - Straight	1	
	102237	3MI Machines	2	2JC-102A	2007	Pin - Oil Gauge	1	
2JC-102A		Nut - Damper Adjusting	2	2JC-102A	0004	Gasket - Oil Gauge	1	
	102103	2MI, 2MI Machines	2	2JC-102A	2001	Dial - Oil Gauge	1	
	102103	3MI Machines	1	2JC-103A	2002	Gasket - Oil Gauge	1	
2JC-103A	110070	Spring - Compression	1	2JC-104A		Support - Arbor + Type "B" with Legs	1	
2JC-104A	103	Pin - Cutter	1		110274	Oil, 2MI Machines	2	
2JC-105A	120009	Nut - Tension	1		120203	3MI Machines	1	
2JC-106A		Screw	1	2JC-107A	2001	Adapter - Arbor Support Running	1	
	2201	2MI, 2MI Machines	1	2JC-107A	2002	Screw	1	
	2211	3MI Machines	1	2JC-107A	0073	Cover - Gage	1	
2JC-107A		Screw	1	2JC-107A	2003	Steps (Type "A" Support)	1	
	2223	2MI, 2MI Machines	1	2JC-107A	170	Washer - Flank (Type "A" Support)	1	
	2223	3MI Machines	1	2JC-107A		Support - Arbor (Type "B" without Legs)	1	
2JC-108A		Screw	1		122702	Oil, 2MI Machines	1	
	2201	2MI, 2MI Machines	1		120204	3MI Machines	1	
	2011	2MI Machines	1	2JC-109A		Support - Arbor - Type "A"	1	
2JC-109A		Screw	1		110273	Oil, 2MI Machines	1	
	2227	2MI, 2MI Machines	1		120201	2MI Machines	1	
	2224	3MI Machines	1	2JC-109A	2001	Running (Type "A" Support)	1	
2JC-170A		Overarm	1	2JC-109A	2002	Screw (Type "B" Support)	1	
	102274	2MI, 2MI Machines	1	2JC-109A	2074	Pin - Oil (Type "B" Support)	1	
	102284	3MI Machines	1	2JC-109A	2075	Nut - Arbor Adjusting (Type "B" Support)	1	
2JC-171A	2001	Pin - Straight	1	2JC-109A	2002	Running - Arbor Support (Type "B" Support)	1	
2JC-172A	120202	Pin - Square	1		2JC-201A	1010	Washer - Plain (Type "B" Support) With Legs	1
2JC-173A	1001	Nut - Hex	1		2JC-202A	070	Screw (Type "B" Support With Legs)	1
2JC-174A	704	Washer	1		2JC-203A	010	Screw	1
2JC-175A		Bed	1		2JC-204A	1000	Washer - Plain	1
	120001	2MI, 2MI Machines	1		2JC-205A		Brake - Overarm	1
	71143	3MI Machines	1		107000	Oil, 2MI Machines	1	
2JC-176A	01017	Wick	1		107200	2MI Machines	1	
2JC-177A	00344	Tube	1	2JC-206A	111312	Clamp - Overarm Brace	1	
2JC-178A	3010	Pin - Straight	1					
2JC-179A	03001	Pin	1					

CONTROL LEVERS



CINCINNATI NOS 2 ML 2 MU AND 2 MI MILLING MACHINES

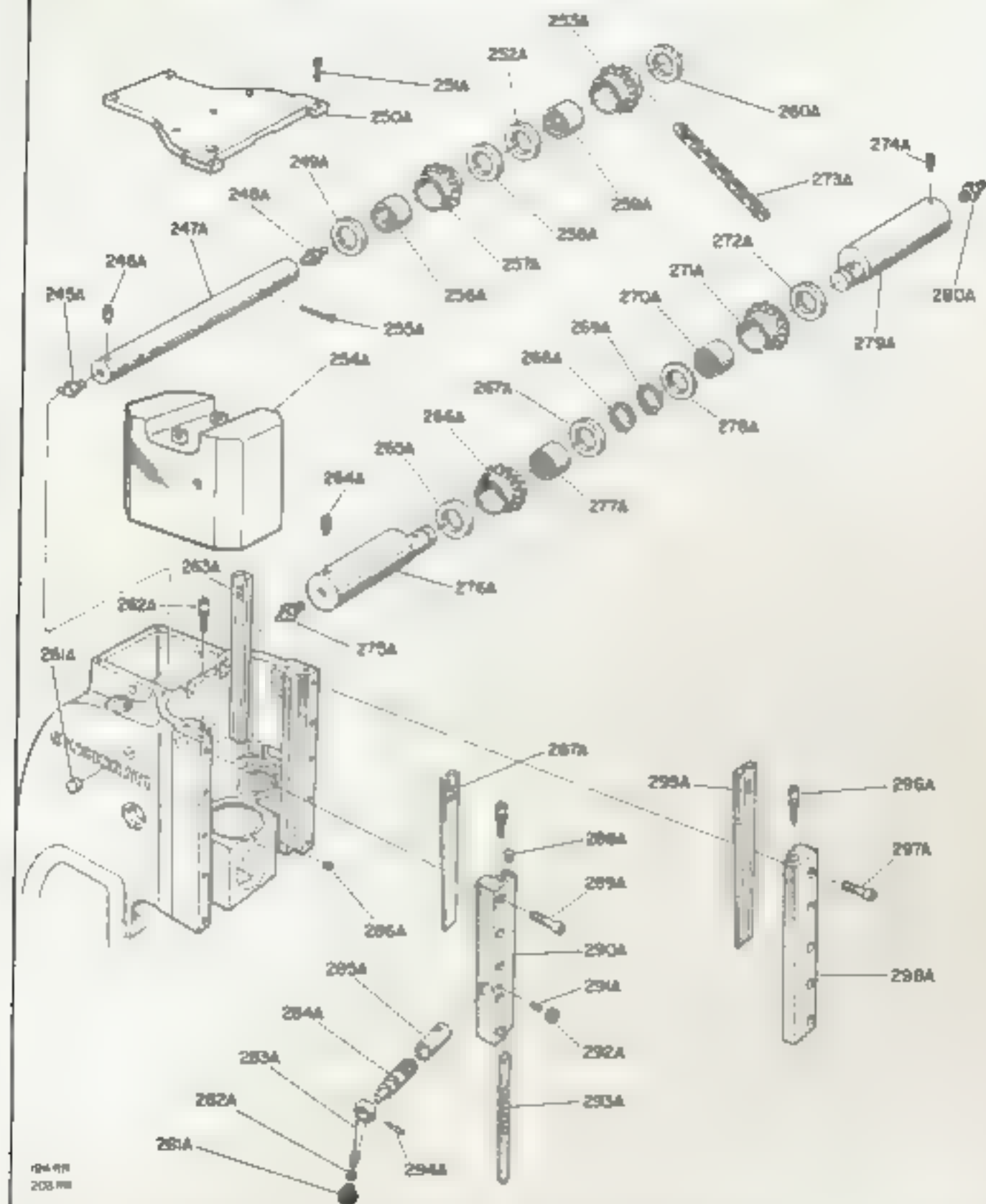
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

2ML, 2MU AND 2MI PLAIN AND UNIVERSAL 2MU VERTICAL

Key No	Part No.	Part Name	AM Code	Key No	Part No.	Part Name	AM Code
2JC-207A	159013	Shaft - Starting Lever	1	2JC-236A	13391	Hub - Pilot Wheel (Plain and Universal Machines Only)	1
	159014	Plain and Universal Machines	1	2JC-237A	3040	Hub (Plain and Universal Machines Only)	1
2JC-208A	157114	Vertical Machines	1	2JC-238A	3131	Washer - Lock (Plain and Universal Machines Only)	1
		Lever - Starting (Plain and Universal Machines Only)	1	2JC-239A	159013	Ball - Handle (Plain and Universal Machines Only)	1
2JC-208A	3131	Washer - Lock	1	2JC-239A	345	Key (Plain and Universal Machines Only)	1
2JC-210A	159013	Ball - Handle	1	2JC-239A	2135	Screw - Set	1
2JC-211A	159013	Lever - Starting (Vertical Machines Only)	1	2JC-239A	13391	Frame - Pilot Wheel	1
2JC-212A	3040	Hub	1		13391	2ML, 2MU, Plain and Universal Machines	1
2JC-212A	3131	Screw - Set (Plain and Universal Machines Only)	1		13391	2MI Machine	1
2JC-214A	159013	Hub - Starting Lever	1	2JC-239A	13391	Hub - Clamp	1
2JC-214A	103037	Clutch - Starting Lever	1		13391	2ML, 2MU, Plain and Universal Machines	1
2JC-214A	345	Pin - Taper	1		13391	2MI Machine	1
2JC-214A		Stud - Overarm Clamp	1	2JC-239A	700	Washer (Plain and Universal Machines Only)	1
	115447	2ML, 2MU, Plain and Universal Machines	1	2JC-239A	3401	Hub - Key (Plain and Universal Machines Only)	1
	128241	2MI Machine	1	2JC-239A	13391	Hub and Housing - Starting Lever	1
2JC-218A	115450	Washer (Plain and Universal Machines Only)	1		13391	Clutch Set	1
2JC-218A	3401	Hub - Key (Plain and Universal Machines Only)	1	2JC-237A	11114	Toggle - Starting Lever	1
2JC-230A	3339	Screw - Set (Plain and Universal Machines Only)	1	2JC-238A	13391	Toggle - Spindle Stop (With Spindle Stop)	1
2JC-230A		Screw - Set	1	2JC-239A	33941	Pin - Locking	1
	1223	2ML, 2MU, Plain and Universal Machines	1	2JC-240A	2135	Washer - Lock	1
	1223	2MI Machine	1	2JC-241A	1671	Hub - Key	1
2JC-232A	1223	Screw - Set	1	2JC-241A	33941	Pin - Locking (With Spindle Stop)	1
2JC-232A	1517	Screw - Set	1	2JC-241A	2131	Washer - Lock (With Spindle Stop)	1
2JC-234A	09183	Roller (Plain and Universal Machines Only)	1	2JC-241A	3401	Hub - Key (With Spindle Stop)	1
2JC-238A		Screw - Pilot Wheel	1				
	131123	2ML, 2MU, Plain and Universal Machines	1				
	159013	2MI Machine	1				

VERTICAL HEAD COUNTERWEIGHT AND GUIDES

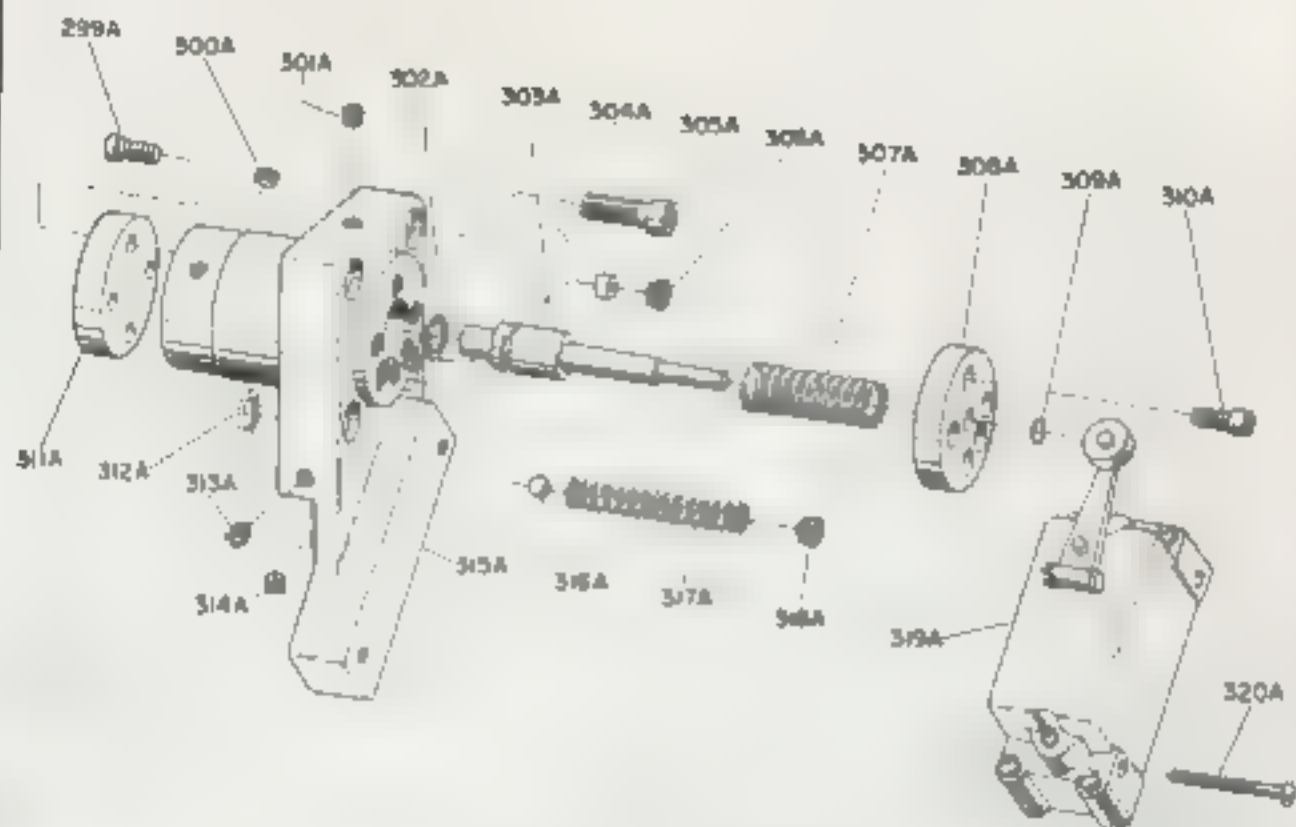


WHEN ORDERING PARTS give us complete part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page H. How to Order Better Parts

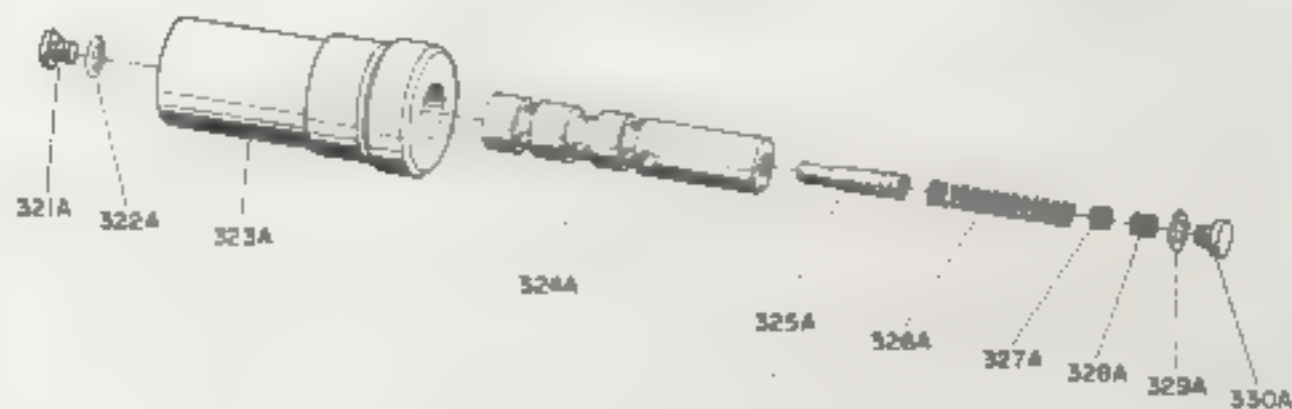
3.4.4 VERTICAL MOVEMENT

[illegible]

FEED CONTROL VALVE



RELIEF VALVE



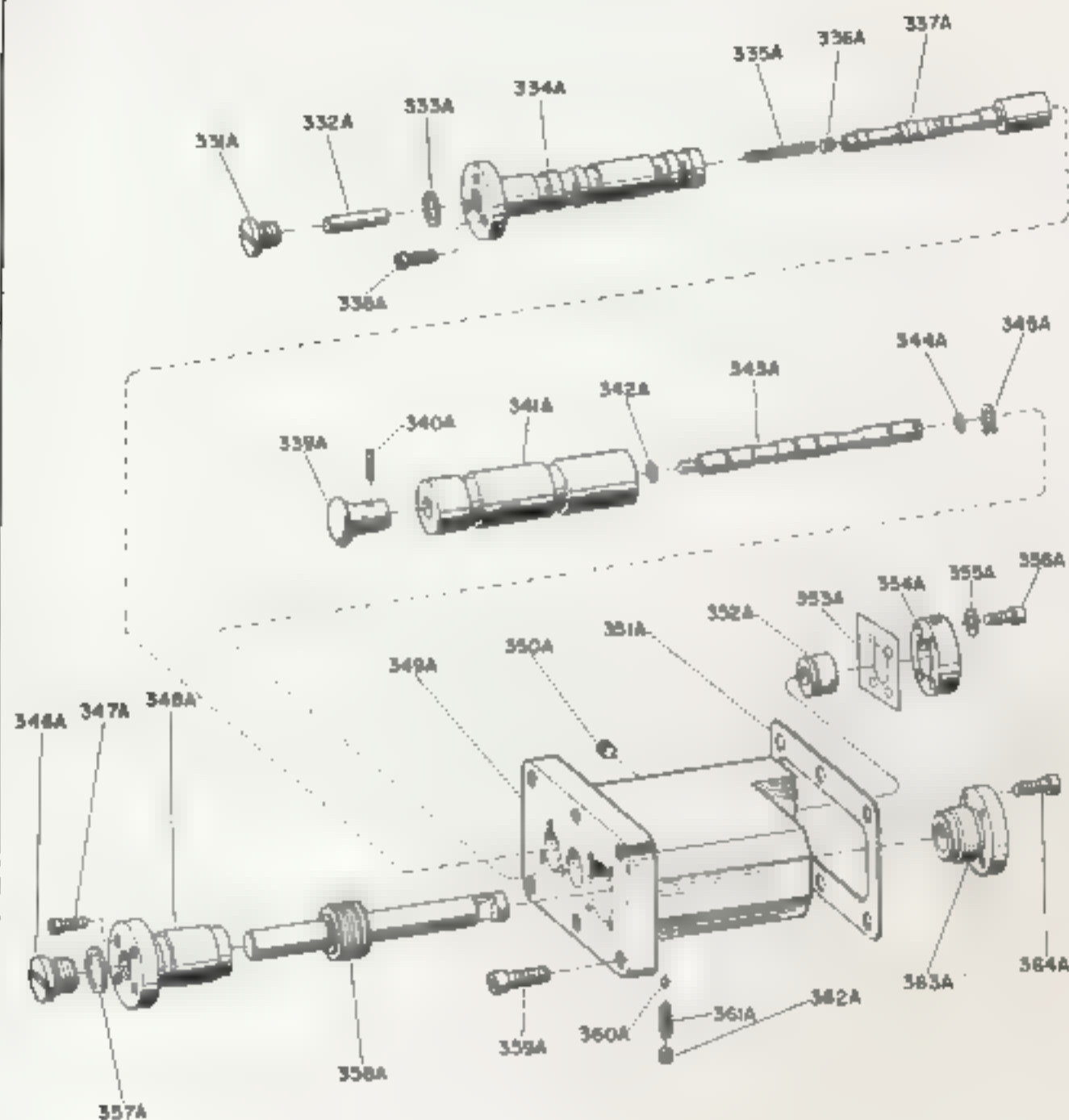
WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 59 "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

2M, 2AM AND 2AU PLAIN AND UNIVERSAL
2M VERTICAL

Key No.	Part No.	Part Name	QTY.	QTY.	QTY.	QTY.	QTY.	QTY.
211	2894	2114	1	1	1	1	1	1
212	2895	2115	1	1	1	1	1	1
213	2896	2116	1	1	1	1	1	1
214	2897	2117	1	1	1	1	1	1
215	2898	2118	1	1	1	1	1	1
216	2899	2119	1	1	1	1	1	1
217	2900	2120	1	1	1	1	1	1
218	2901	2121	1	1	1	1	1	1
219	2902	2122	1	1	1	1	1	1
220	2903	2123	1	1	1	1	1	1
221	2904	2124	1	1	1	1	1	1
222	2905	2125	1	1	1	1	1	1
223	2906	2126	1	1	1	1	1	1
224	2907	2127	1	1	1	1	1	1
225	2908	2128	1	1	1	1	1	1
226	2909	2129	1	1	1	1	1	1
227	2910	2130	1	1	1	1	1	1
228	2911	2131	1	1	1	1	1	1
229	2912	2132	1	1	1	1	1	1
230	2913	2133	1	1	1	1	1	1
231	2914	2134	1	1	1	1	1	1
232	2915	2135	1	1	1	1	1	1
233	2916	2136	1	1	1	1	1	1
234	2917	2137	1	1	1	1	1	1
235	2918	2138	1	1	1	1	1	1
236	2919	2139	1	1	1	1	1	1
237	2920	2140	1	1	1	1	1	1
238	2921	2141	1	1	1	1	1	1
239	2922	2142	1	1	1	1	1	1
240	2923	2143	1	1	1	1	1	1
241	2924	2144	1	1	1	1	1	1
242	2925	2145	1	1	1	1	1	1
243	2926	2146	1	1	1	1	1	1
244	2927	2147	1	1	1	1	1	1
245	2928	2148	1	1	1	1	1	1
246	2929	2149	1	1	1	1	1	1
247	2930	2150	1	1	1	1	1	1
248	2931	2151	1	1	1	1	1	1
249	2932	2152	1	1	1	1	1	1
250	2933	2153	1	1	1	1	1	1
251	2934	2154	1	1	1	1	1	1
252	2935	2155	1	1	1	1	1	1
253	2936	2156	1	1	1	1	1	1
254	2937	2157	1	1	1	1	1	1
255	2938	2158	1	1	1	1	1	1
256	2939	2159	1	1	1	1	1	1
257	2940	2160	1	1	1	1	1	1
258	2941	2161	1	1	1	1	1	1
259	2942	2162	1	1	1	1	1	1
260	2943	2163	1	1	1	1	1	1
261	2944	2164	1	1	1	1	1	1
262	2945	2165	1	1	1	1	1	1
263	2946	2166	1	1	1	1	1	1
264	2947	2167	1	1	1	1	1	1
265	2948	2168	1	1	1	1	1	1
266	2949	2169	1	1	1	1	1	1
267	2950	2170	1	1	1	1	1	1
268	2951	2171	1	1	1	1	1	1
269	2952	2172	1	1	1	1	1	1
270	2953	2173	1	1	1	1	1	1
271	2954	2174	1	1	1	1	1	1
272	2955	2175	1	1	1	1	1	1
273	2956	2176	1	1	1	1	1	1
274	2957	2177	1	1	1	1	1	1
275	2958	2178	1	1	1	1	1	1
276	2959	2179	1	1	1	1	1	1
277	2960	2180	1	1	1	1	1	1
278	2961	2181	1	1	1	1	1	1
279	2962	2182	1	1	1	1	1	1
280	2963	2183	1	1	1	1	1	1
281	2964	2184	1	1	1	1	1	1
282	2965	2185	1	1	1	1	1	1
283	2966	2186	1	1	1	1	1	1
284	2967	2187	1	1	1	1	1	1
285	2968	2188	1	1	1	1	1	1
286	2969	2189	1	1	1	1	1	1
287	2970	2190	1	1	1	1	1	1
288	2971	2191	1	1	1	1	1	1
289	2972	2192	1	1	1	1	1	1
290	2973	2193	1	1	1	1	1	1
291	2974	2194	1	1	1	1	1	1
292	2975	2195	1	1	1	1	1	1
293	2976	2196	1	1	1	1	1	1
294	2977	2197	1	1	1	1	1	1
295	2978	2198	1	1	1	1	1	1
296	2979	2199	1	1	1	1	1	1
297	2980	2200	1	1	1	1	1	1
298	2981	2201	1	1	1	1	1	1
299	2982	2202	1	1	1	1	1	1
300	2983	2203	1	1	1	1	1	1
301	2984	2204	1	1	1	1	1	1
302	2985	2205	1	1	1	1	1	1
303	2986	2206	1	1	1	1	1	1
304	2987	2207	1	1	1	1	1	1
305	2988	2208	1	1	1	1	1	1
306	2989	2209	1	1	1	1	1	1
307	2990	2210	1	1	1	1	1	1
308	2991	2211	1	1	1	1	1	1
309	2992	2212	1	1	1	1	1	1
310	2993	2213	1	1	1	1	1	1
311	2994	2214	1	1	1	1	1	1
312	2995	2215	1	1	1	1	1	1
313	2996	2216	1	1	1	1	1	1
314	2997	2217	1	1	1	1	1	1
315	2998	2218	1	1	1	1	1	1
316	2999	2219	1	1	1	1	1	1
317	3000	2220	1	1	1	1	1	1
318	3001	2221	1	1	1	1	1	1
319	3002	2222	1	1	1	1	1	1
320	3003	2223	1	1	1	1	1	1
321	3004	2224	1	1	1	1	1	1
322	3005	2225	1	1	1	1	1	1
323	3006	2226	1	1	1	1	1	1
324	3007	2227	1	1	1	1	1	1
325	3008	2228	1	1	1	1	1	1
326	3009	2229	1	1	1	1	1	1
327	3010	2230	1	1	1	1	1	1
328	3011	2231	1	1	1	1	1	1
329	3012	2232	1	1	1	1	1	1
330	3013	2233	1	1	1	1	1	1
331	3014	2234	1	1	1	1	1	1
332	3015	2235	1	1	1	1	1	1
333	3016	2236	1	1	1	1	1	1
334	3017	2237	1	1	1	1	1	1
335	3018	2238	1	1	1	1	1	1
336	3019	2239	1	1	1	1	1	1
337	3020	2240	1	1	1	1	1	1
338	3021	2241	1	1	1	1	1	1
339	3022	2242	1	1	1	1	1	1
340	3023	2243	1	1	1	1	1	1
341	3024	2244	1	1	1	1	1	1
342	3025	2245	1	1	1	1	1	1
343	3026	2246	1	1	1	1	1	1
344	3027	2247	1	1	1	1	1	1
345	3028	2248	1	1	1	1	1	1
346	3029	2249	1	1	1	1	1	1
347	3030	2250	1	1	1	1	1	1
348	3031	2251	1	1	1	1	1	1
349	3032	2252	1	1	1	1	1	1
350	3033	2253	1	1	1	1	1	1
351	3034	2254	1	1	1	1	1	1
352	3035	2255	1	1	1	1	1	1
353	3036	2256	1	1	1	1	1	1
354	3037	2257	1	1	1	1	1	1
355	3038	2258	1	1	1	1	1	1
356	3039	2259	1	1	1	1	1	1
357	3040	2260	1	1	1	1	1	1
358	3041	2261	1	1	1	1	1	1
359	3042	2262	1	1	1	1	1	1
360	3043	2263	1	1	1	1	1	1
361	3044	2264	1	1	1	1	1	1
362	3045	2265	1	1	1	1	1	1
363	3046	2266	1	1	1	1	1	1
364	3047	2267	1	1	1	1	1	1
365	3048	2268	1	1	1	1	1	1
366	3049	2269	1	1	1	1	1	1
367	3050	2270	1	1	1	1	1	1
368	3051	2271	1	1	1	1	1	1
369	3052	2272	1	1	1	1	1	1
370	3053	2273	1	1	1	1	1	1
371	3054	2274	1	1	1	1	1	1
372	3055	2275	1	1	1	1	1	1
373	3056	2276	1	1	1	1	1	1
374	3057	2277	1	1	1	1	1	1
375	3058	2278	1	1	1	1	1	1
376	3059	2279	1	1	1	1	1	1
377	3060	2280	1	1	1	1	1	1
378	3061	2281	1	1	1	1	1	1
379	3062	2282	1	1	1	1	1	1
380	3063	2283	1	1	1	1	1	1
381	3064	2284	1	1	1	1	1	1
382	3065	2285	1	1	1	1	1	1
383	3066	2286	1	1	1	1	1	1
384	3067	2287	1	1	1	1	1	1
385	3068	2288	1	1	1	1	1	1
386	3069	2289	1	1	1	1	1	1
387	3070	2290	1	1	1	1	1	1

SPINDLE STOP VALVE



CINCINNATI NOS 2 ML 2 MI AND 3 MI MILING MACHINES

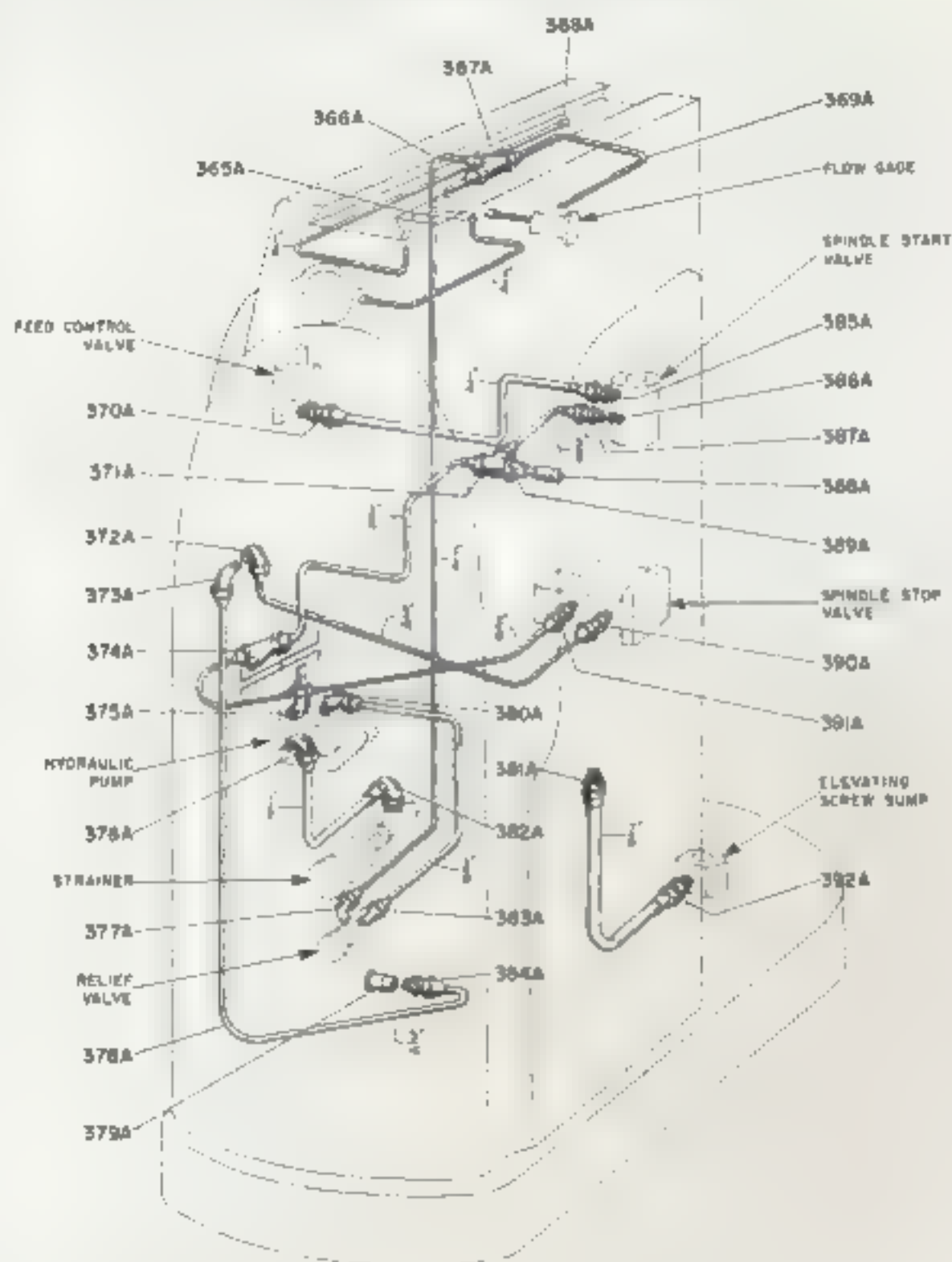
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued)

PLAIN AND VERTICAL MACHINES WITH AUTO TABLE CYCLE

Key No.	Part No.	Part Name	Am't Used	Key No.	Part No.	Part Name	Am't. Used
2JC-233A	142512	Ring - Spring Retainer	1	2JC-348A	141143	Spooling - Final - Spindle Stop Valve	1
2JC-233A	5277	Pin	1	2JC-348A	153491	Body - Spindle Stop Valve	1
2JC-233A	523450	Outlet	1	2JC-350A	10481	Plug - Pipe	2
2JC-234A	161254	Bushings - Pilot Valve	1	2JC-351A	117134	Gasket - Spindle Stop Valve Body	1
2JC-235A	163524	Spring	1	2JC-352A	145885	Cartridge - Spindle Stop Valve	1
2JC-236A	6234	Plug - Pipe	1	2JC-353A	143992	Gasket - Spindle Stop Valve	1
2JC-237A	144050	Plunger - Pilot Valve	1	2JC-354A	143004	Cap - Valve	1
2JC-238A	2294	Screw	2	2JC-355A	2135	Washer - Lock	4
2JC-239A	141192	Knob	1	2JC-356A	2394	Screw	4
2JC-240A	140	Pin - Taper	1	2JC-357A	79111	Outlet	1
2JC-241A	141347	Bushings - Control Valve	1	2JC-358A	141345	Plunger - Spindle Stop Valve	1
2JC-242A	242780	Ring - "O"	1	2JC-359A	2321	Screw	8
2JC-243A	141348	Plunger - Control Valve	1	2JC-360A	2290	Bolt - Steel	1
2JC-244A	242780	Ring - "O"	1	2JC-361A	237417	Spring	1
2JC-245A	230910	Ring - Retainer	1	2JC-362A	4234	Plug - Pipe	1
2JC-246A	138235	Plug - Screw	1	2JC-363A	141349	Bushings - Gears - Spindle Stop Valve	1
2JC-247A	2294	Screw	4	2JC-364A	2298	Screw	4

COLUMN TUBING PLAIN AND UNIVERSAL MACHINES



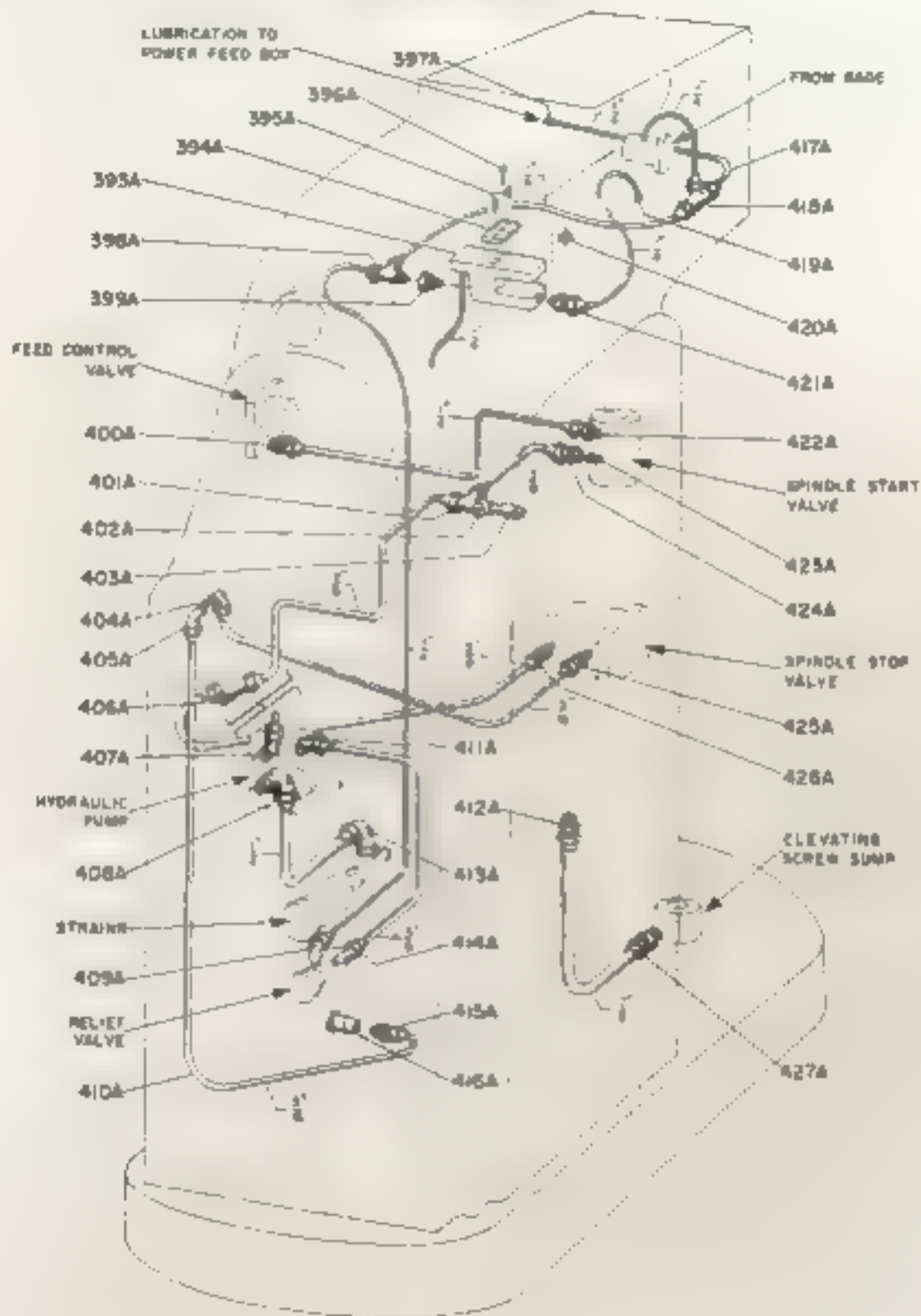
CINCINNATI NOS 2 ML 2 M AND 3 M MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

COLUMN — UNIT No. 2JC (Continued) PLAIN AND UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Am. Used	Key No.	Part No.	Part Name	Am. Used
2JC-344A	2190	Masking - Tubing . . .	0	2JC-379A	142518	Tubing Lim (With Spindle Stop)	1
2JC-344A		Tubing Lim	1	2JC-379A	159013	Masking - Adapter (With Spindle Stop)	1
	149844	2ML 2ML Machines	1	2JC-380A	67369	Fitting - Elbow	1
	181912	3ML Machines	1	2JC-381A	77120	Fitting - Tubing	1
2JC-387A	84408	Fitting - Tubing - Tee	1	2JC-382A	93019	Fitting - Elbow	1
2JC-388A	3190	Masking - Tubing . . .	1	2JC-383A	67369	Fitting - Elbow	1
2JC-389A	111784	Tube - Spray	1	2JC-384A	70343	Fitting - Tubing (With Spindle Stop)	1
2JC-390A	48944	Fitting - Tubing	1	2JC-385A	89444	Fitting - Tubing	1
2JC-391A	4022	Fitting - Tee	1	2JC-386A	18008	Knock - Pipe	1
2JC-392A	4013	Fitting - Elbow (With Spindle Stop)	1	2JC-387A	89159	Fitting - Tubing	1
2JC-393A	4013	Fitting - Elbow (Without Spindle Stop)	1	2JC-388A	11520	Fitting - Hydraulic	1
2JC-394A	64490	Fitting - Tee (With Spindle Stop)	1	2JC-389A	86143	Coupling - Reducing	1
2JC-395A	67288	Fitting - Elbow (With Spindle Stop)	1	2JC-390A	57287	Fitting - Tubing (With Spindle Stop)	1
2JC-396A	83018	Fitting - Elbow	1	2JC-391A	70343	Fitting - Tubing (With Spindle Stop)	1
2JC-397A	86152	Fitting - Elbow	1	2JC-392A	78730	Fitting - Tubing	1

COLUMN TUBING VERTICAL MACHINES

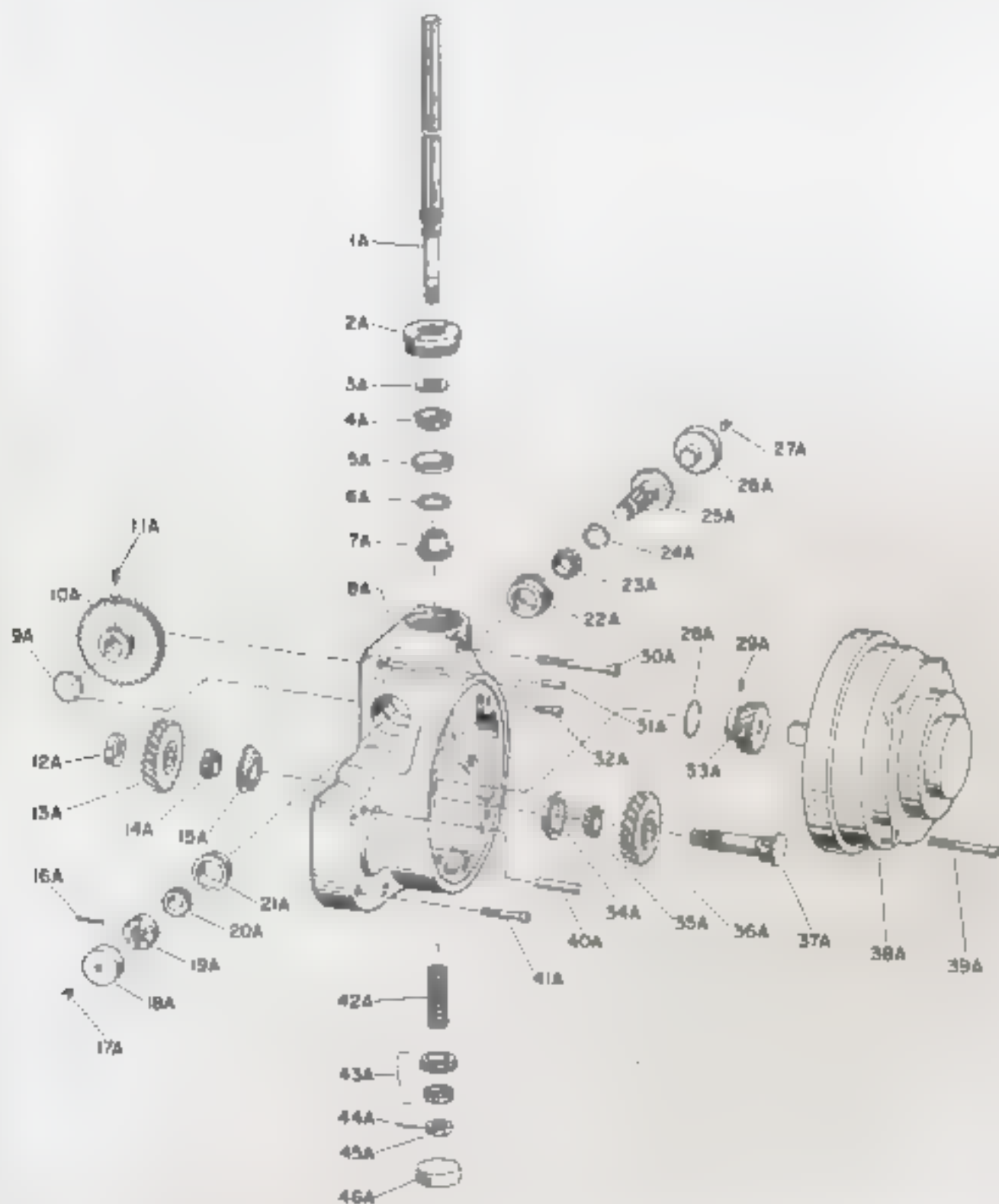


WHEN ORDERING PARTS give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

2MM VERTICAL MACHINES

[illegible]

DRIVE FROM KNEE



CINCINNATI NOS 2 ML 2 M2 AND 3 M1 MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 59, "How to Order Repair Parts."

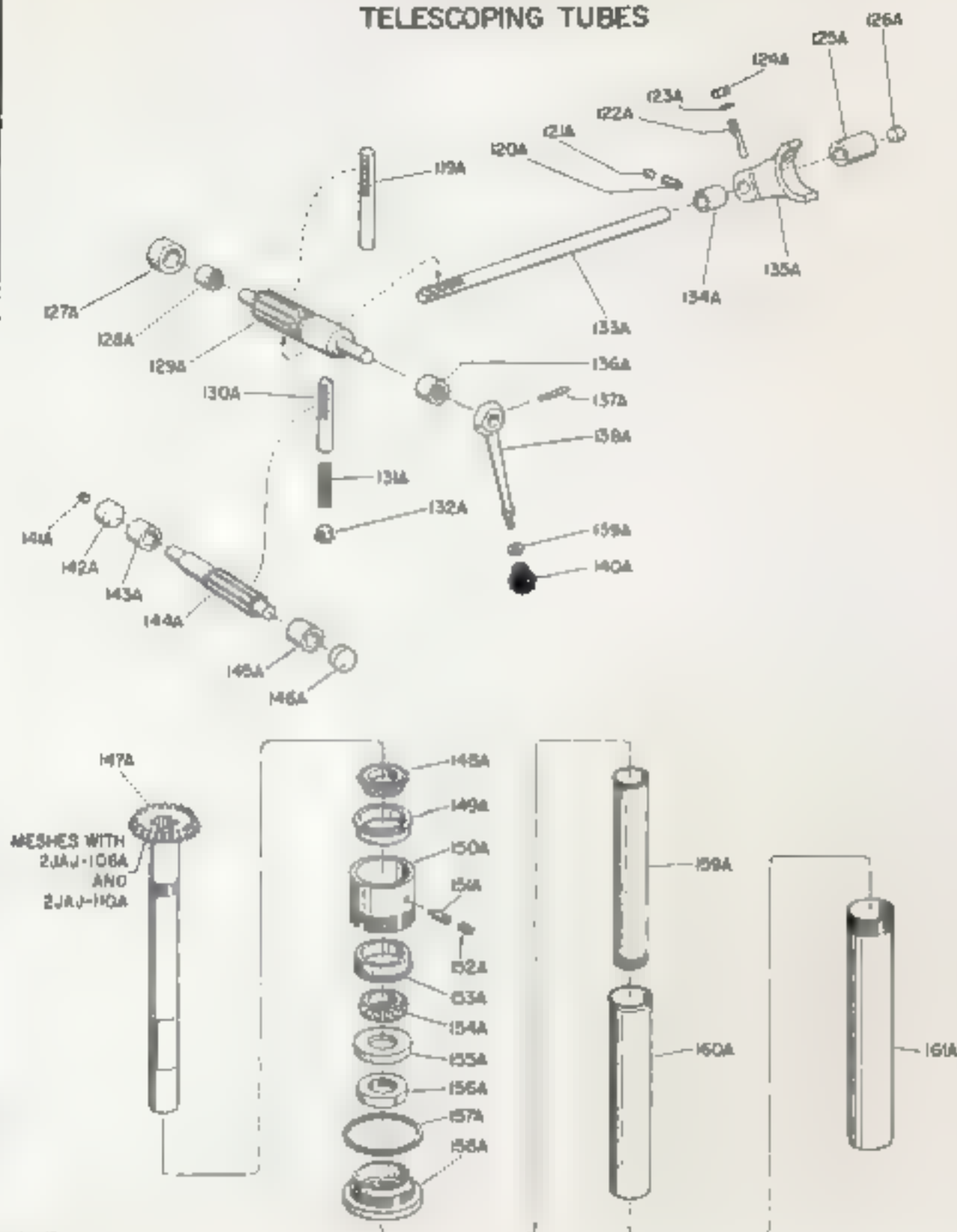
FEED TO VERTICAL HEAD — UNIT No. 2JAJ

2M1 VERTICAL MACHINES WITH POWER FEED TO VERTICAL HEAD

Key No.	Part No.	Part Name	Qty. Used	Key No.	Part No.	Part Name	Qty. Used
2JAJ-1A	130503	Shaft - Vertical Spine	1	2JAJ-36A	214315	Plug	1
2JAJ-2A	118511	Cup	1	2JAJ-37A	1527	Screw	1
2JAJ-3A	139123	Washer - Vertical Spine Shaft	1	2JAJ-38A	96189	Ring - Retainer	1
2JAJ-4A	88546	Cone - Bearing	1	2JAJ-39A	1272	Reten. Nut	1
2JAJ-5A	88546	Cup - Bearing	1	2JAJ-39A	3216	Screw	1
2JAJ-6A	114344	Spacer - Spiral Bevel	1	2JAJ-31A	3348	Pin	1
2JAJ-7A	114323	Pinion - Spiral Bevel	1	2JAJ-31A	3348	Screw	1
2JAJ-8A	114334	Bracket - Motor Drive	1	2JAJ-31A		Pinion - Spiral - Motor Shaft	1
2JAJ-9A	30836	Ring - Spring	1		111412	1800 RPM Motor	1
2JAJ-10A	118314	Gear - Bevel Gear Drive Shaft	1		111948	1800 RPM Motor	1
2JAJ-11A	1136	Screw - Nut	1	2JAJ-34A	108347	Cup - Bearing	1
2JAJ-12A	4341	Nut - Lock	1	2JAJ-35A	21304	Cone - Bearing	1
2JAJ-13A	114837	Gear - Helical Driver	1	2JAJ-35A		Gear - Helical - Driver	1
2JAJ-14A	213901	Cone - Bearing	1		111319	1800 RPM Motor	1
2JAJ-15A	124387	Cup - Bearing	1		111948	1800 RPM Motor	1
2JAJ-16A	1859	Pin - Collar	1	2JAJ-17A	111373	Shaft - Motor Drive Bracket	1
2JAJ-17A	1911	Screw	1	2JAJ-18A	Example*	Motor - Drive	1
2JAJ-18A	3493	Plug	1	2JAJ-19A	Example*	Screw - Mount	1
2JAJ-19A	111335	Nut	1	2JAJ-20A	3493	Pin	1
2JAJ-20A	78731	Cone - Bearing	1	2JAJ-21A	3493	Screw	1
2JAJ-21A	78733	Cup - Bearing	1	2JAJ-22A	237230	Spring - Compression	1
2JAJ-22A	213434	Cup - Bearing	1	2JAJ-23A	71223	Bearing - Ball	1
2JAJ-23A	113804	Cone - Bearing	1	2JAJ-24A	113	Pin - Collar	1
2JAJ-24A	113304	Spacer	1	2JAJ-25A	96189	Nut - Round Flange	1
2JAJ-25A	113325	Gear - Spiral Bevel	1	2JAJ-26A	3254	Plug	1

*Enter Serial Number of Machine when ordering this part.

SHIFTING LINKAGE TELESCOPING TUBES



198 199
197 198

CINCINNATI NOS 2 ML 2 M AND 3 M MILLING MACHINES

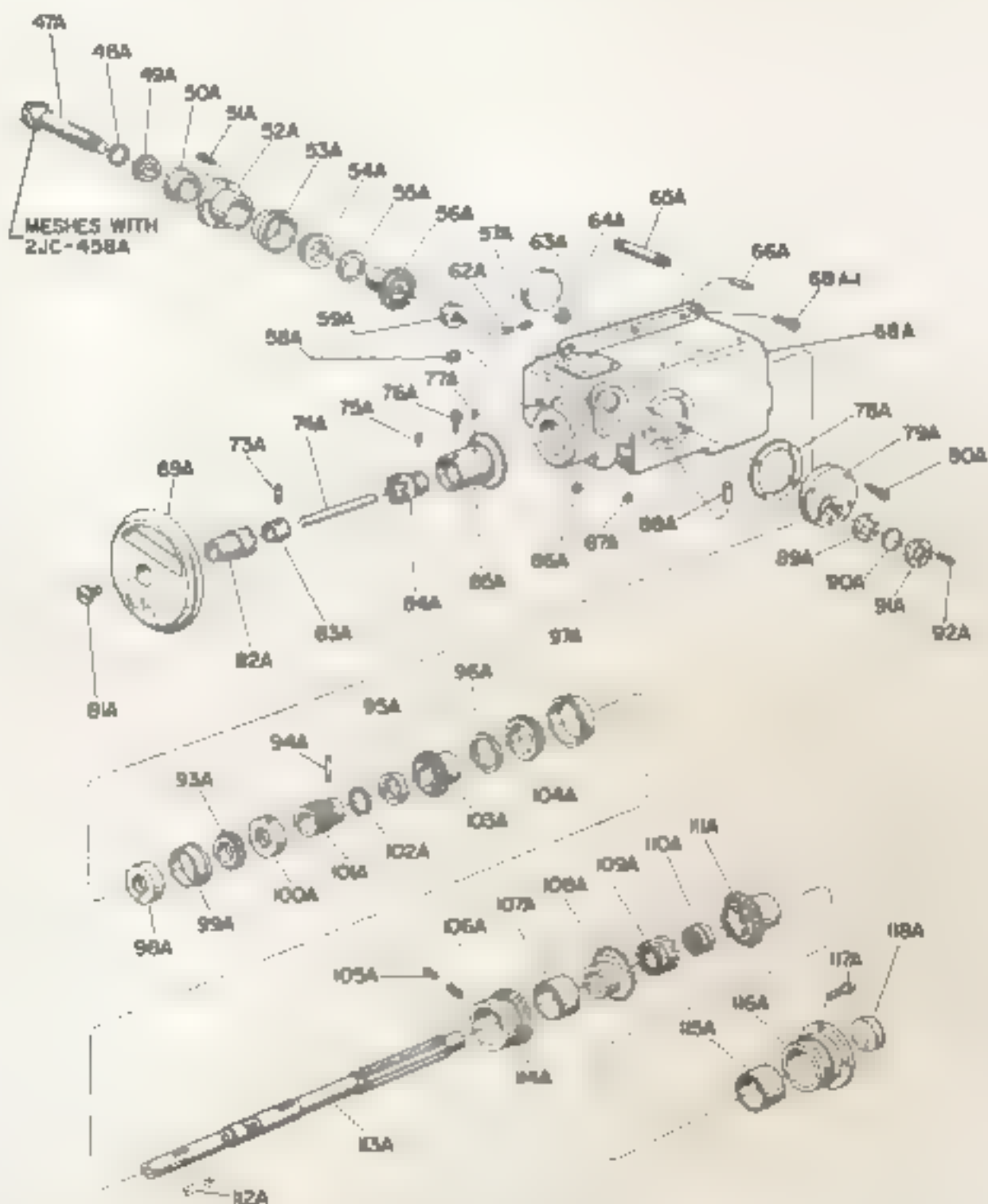
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 79, "How to Order Repair Parts."

FEED TO VERTICAL HEAD — UNIT No. 2JAJ (Continued)

3M VERTICAL MACHINES WITH POWER FEED TO VERTICAL HEAD

Key No.	Part No.	Part Name	Ass. Lead	Key No.	Part No.	Part Name	Ass. Lead
2JAJ-47A	130803	Gear - Bevel Drive on Feed Screw	1	2JAJ-48A	76844	Plug	1
2JAJ-48A	113308	Washer - Flaring	1	2JAJ-49A	230784	Plug	1
2JAJ-49A	40107	Cone - Bearing	1	2JAJ-50A	114047	Tube - Oil Level	1
2JAJ-50A	108004	Cup - Bearing	1	2JAJ-51A	4077	Gasket - Oil Gage	1
2JAJ-51A	3214	Screw	1	2JAJ-52A	4078	Disk - Oil Gage	1
2JAJ-52A	130804	Washer - Bearing	1	2JAJ-53A	4078	Cover - Oil Gage	1
2JAJ-53A	40580	Cup - Bearing	1	2JAJ-54A	3194	Screw	4
2JAJ-54A	44543	Cone - Bearing	1	2JAJ-55A	44794	Cone - Bearing	1
2JAJ-55A	118343	Spacer - Bevel Pinion	1	2JAJ-56A	100127	Pin	1
2JAJ-56A	118344	Gasket - Drive Shaft Hous.	1	2JAJ-57A	113370	Collar - Lock	1
2JAJ-57A	2234	Screw - Set	1	2JAJ-58A	130454	Spacer - Flaring	1
2JAJ-58A	130744	Plug - Pipe	1	2JAJ-59A	124711	Cup - Bearing	1
2JAJ-59A	4134	Nut - Lock	1	2JAJ-60A	113347	Plug - Oil Retained	1
2JAJ-60A	1911	Screw - Set	1	2JAJ-61A	113413	Cup - Bearing	1
2JAJ-61A	2478	Plug	1	2JAJ-62A	4188	Nut - Lock	1
2JAJ-62A	102441	Ring - Seal	1	2JAJ-63A	113080	Flange - Hard	1
2JAJ-63A	113772	Tube - Drain	1	2JAJ-64A	80033	Ring - Seal	1
2JAJ-64A	1344	Pin - Straight	2	2JAJ-65A	113277	Gasket - Bevel Driver	1
2JAJ-65A	125933	Bracket - Upper Power Feed	1	2JAJ-66A	44134	Cone - Bearing	1
2JAJ-66A	3390	Screw	1	2JAJ-67A	76800	Screw - Set	1
2JAJ-67A	134419	Handwheel	1	2JAJ-68A	11323	Screw - Set	1
2JAJ-68A	44214	Pin - Collar	1	2JAJ-69A	113277	Bushing - Reverse - Large	1
2JAJ-69A	113278	Rod - Handwheel	1	2JAJ-70A	113263	Gear - Bevel	1
2JAJ-70A	113179	Screw - Set	1	2JAJ-71A	113264	Clutch - Reverse	1
2JAJ-71A	2233	Screw - Thumb	1	2JAJ-72A	127109	Bushing - Needle	1
2JAJ-72A	124207	Plug - Pipe	1	2JAJ-73A	113263	Gear - Bevel	1
2JAJ-73A	113284	Gasket - Oil Sight Glass	1	2JAJ-74A	2233	Screw	1
2JAJ-74A	113295	Cover - Oil Sight	1	2JAJ-75A	113264	Rad. - Feed Drive	1
2JAJ-75A	2218	Screw	4	2JAJ-76A	113278	Bushing - Clutch Bevel Gear	1
2JAJ-76A	2516	Screw - Handwheel	1	2JAJ-77A	113278	Bushing - Reverse - Large	1
2JAJ-77A	113284	Clutch - Handwheel	1	2JAJ-78A	113280	Retainer - Reverse Gear	1
2JAJ-78A	80148	Collar - Small	1	2JAJ-79A	3318	Screw	4
2JAJ-79A	113285	Clutch - Pin	1	2JAJ-80A	200197	Plug	1
2JAJ-80A	113283	Pin - Handwheel Foot	1				

UPPER BRACKET



CINCINNATI NOS 2 ML, 2 MI AND 3 MI MILING MACHINES

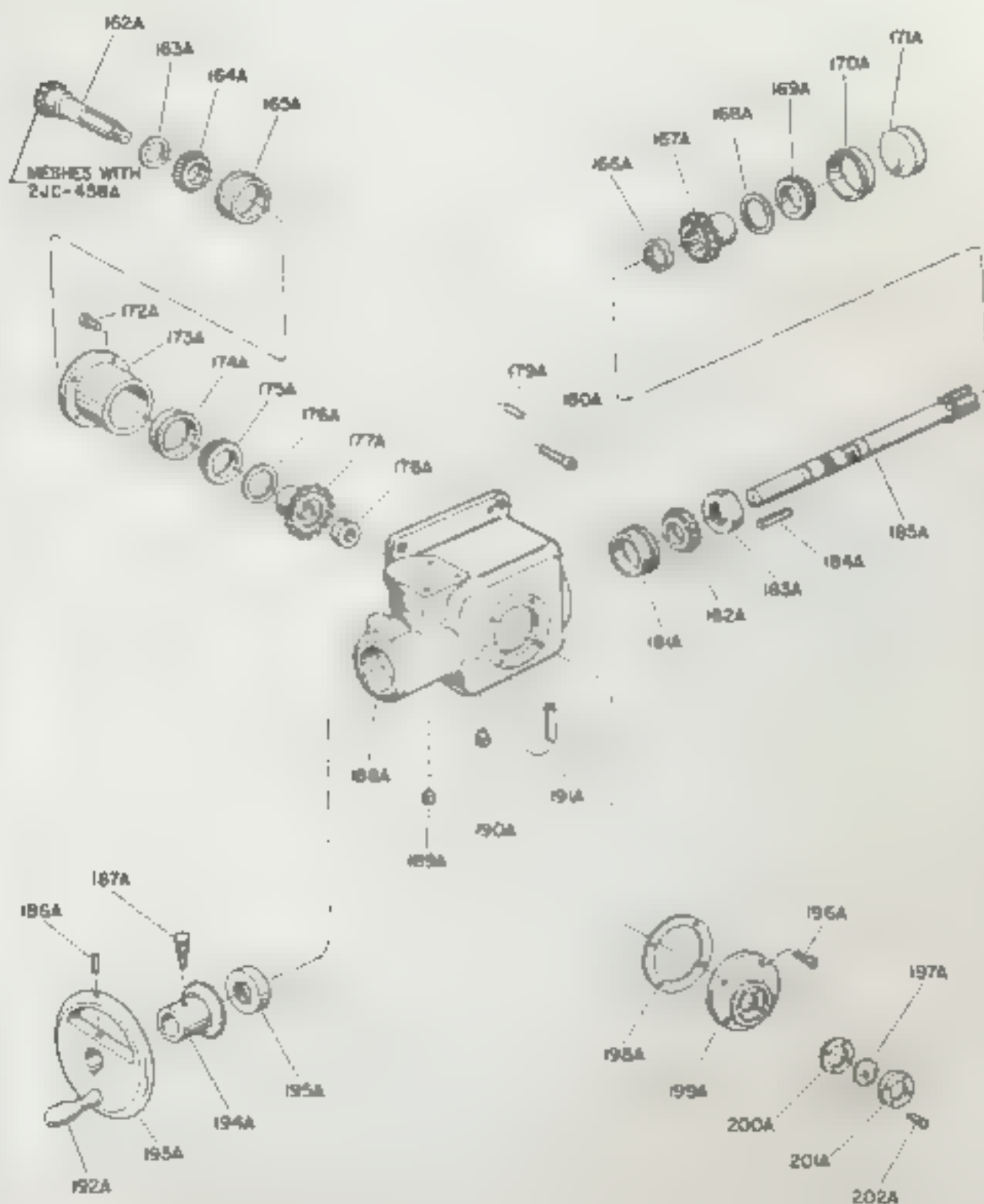
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repeat Parts."

FEED TO VERTICAL HEAD — UNIT No. 2JAJ (Continued)

2MI VERTICAL MACHINES WITH POWER FEED TO VERTICAL HEAD

Key No	Part No	Part Name	Am Used	Key No	Part No	Part Name	Am Used
27A7-119A	110061	Lock - Feed Trip	1	27A7-141A	12901	Screw	1
27A7-120A	12320	Screw - Set	1	27A7-142A	129413	Plug	1
27A7-121A	12323	Screw - Set	1	27A7-143A	121275	Washing - Detent Plunger Piston	1
27A7-122A	14407	Pin - Lock	1	27A7-144A	120887	Piston - Detent Plunger	1
27A7-123A	11338	Washer - Lock	1	27A7-145A	121276	Washing - Detent Plunger Piston	1
27A7-124A	11449	Pin - Key	1	27A7-146A	118237	Plug	1
27A7-125A	113287	Support - Catch Buffer Rod	1	27A7-147A	120418	Gasket - Valve Seat	1
27A7-126A	11310	Plug	1	27A7-148A	115443	Clamp - Bearing	1
27A7-127A	118238	Plug - Bearing	1	27A7-149A	115444	Clamp - Bearing	1
27A7-128A	79123	Bushing - Piston	1	27A7-150A	120811	Shim - Adjusting	1
27A7-129A	120418	Piston - Catch Buffer	1	27A7-151A	12223	Screw	1
27A7-130A	120419	Plunger - Detent	1	27A7-152A	12011	Screw	1
27A7-131A	121270	Spring - Compression	1	27A7-153A	115445	Clamp - Bearing	1
27A7-132A	120784	Plug - Pipe	1	27A7-154A	115446	Clamp - Bearing	1
27A7-133A	110085	Rod - Catch Buffer	1	27A7-155A	118248	Slinger - Oil	1
27A7-134A	10889	Washing	1	27A7-156A	118249	Pin - Lock	1
27A7-135A	118360	Lock - Catch Buffer	1	27A7-157A	120413	Gasket - Threaded Bushing	1
27A7-136A	119248	Bushing - Piston	1	27A7-158A	120408	Bushing - Threaded Slider	1
27A7-137A	843	Pin - Taper	1	27A7-159A	118250	Tube - Lower Telescopic	1
27A7-138A	113887	Handle	1	27A7-160A	118251	Tube - Middle Telescopic	1
27A7-139A	11336	Washer - Lock	1	27A7-161A	120401	Tube - Upper Telescopic	1
27A7-140A	118032	Ball - Piston	1				

HAND FEED BRACKET



CINCINNATI NOS 2 MI, 3 MI AND 3 MI MILLING MACHINES

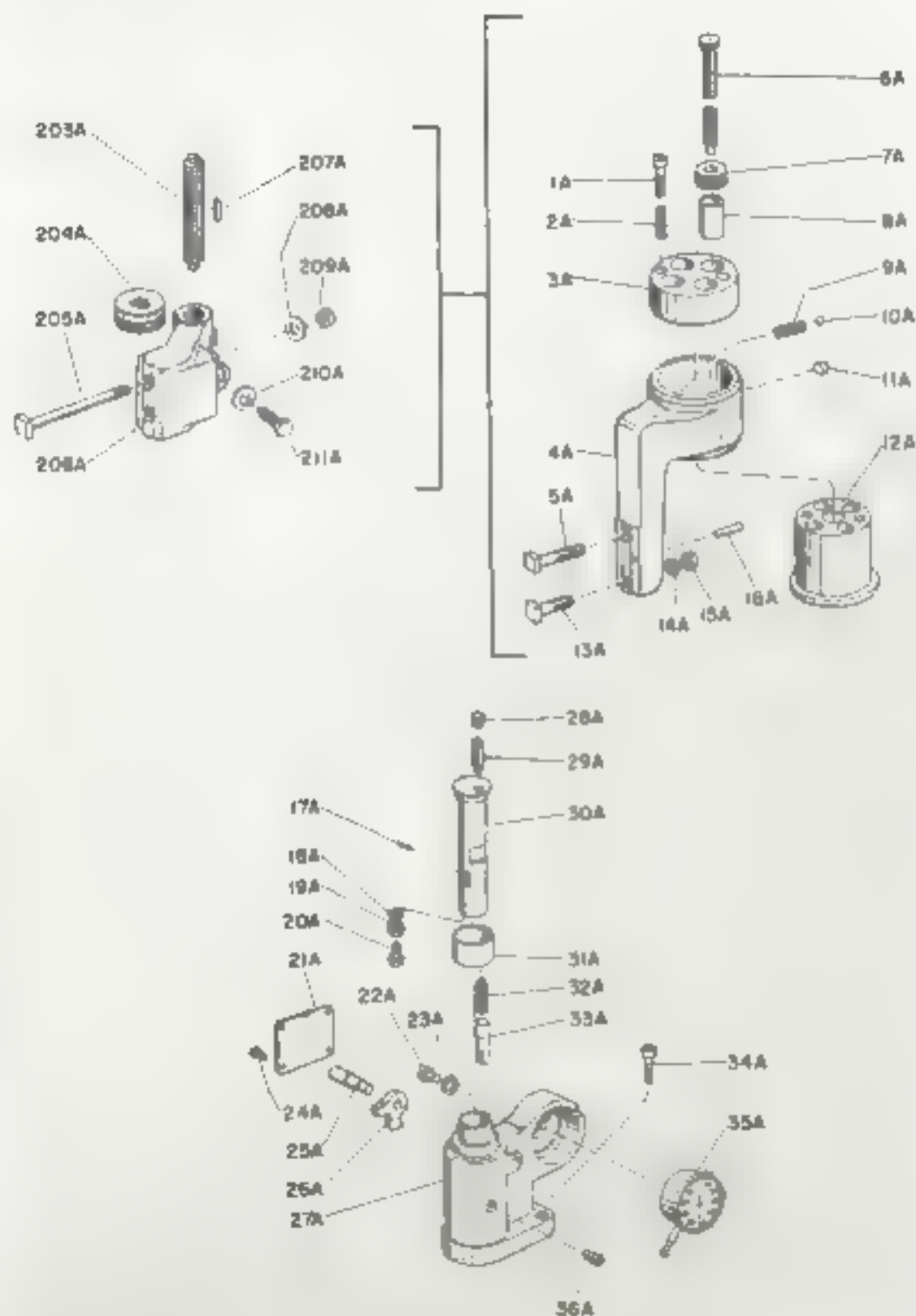
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

FEED TO VERTICAL HEAD—UNIT No. 21AJ (Concluded)

2MI VERTICAL MACHINES WITHOUT POWER FEED TO VERTICAL HEAD

Key No	Part No.	Part Name	Am't Used	Key No	Part No.	Part Name	Am't Used
21AJ-162A	130903	Gear - Bevel Drive to Feed Screw	1	21AJ-161A	5186	Nut - Lock	1
21AJ-163A	116308	Washer - Fltng.	1	21AJ-161A	1833	Key	1
21AJ-164A	90147	Cone - Bearing	1	21AJ-161A	115318	Shaft - Vertical Head Hand Feed	1
21AJ-165A	108054	Cup - Bearing	1	21AJ-164A	3230	Screw - Set	1
21AJ-166A	119270	Collar - Lock	1	21AJ-167A	3258	Screw - Thumb	1
21AJ-167A	116377	Gear - Bevel Drive	1	21AJ-168A	124434	Bracket - Hand Feed	1
21AJ-168A	120614	Spacer - Fltng.	1	21AJ-169A	74949	Plug - Pipe	1
21AJ-169A	49196	Cone - Bearing	1	21AJ-169A	123184	Plug - Pipe	1
21AJ-170A	108271	Cup - Bearing	1	21AJ-171A	119047	Tube - Oil Level	1
21AJ-171A	116335	Plug	1	21AJ-171A	1501	Handle - Handwheel	1
21AJ-172A	1214	Screw	1	21AJ-171A	120430	Handwheel	1
21AJ-173A	120909	Washer - Bearing	1	21AJ-171A	115325	Dial - Hand Feed	1
21AJ-174A	94080	Cup - Bearing	1	21AJ-171A	115387	Plug - Oil Retainer	1
21AJ-175A	11985	Cone - Bearing	1	21AJ-174A	1218	Screw	4
21AJ-176A	116346	Spacer - Bevel Pinion	1	21AJ-174A	4279	Plug - Oil Gauge	1
21AJ-177A	125887	Gear - Drive Shaft Bevel	1	21AJ-174A	115396	Gasket - Oil Sight Glass	1
21AJ-178A	4189	Nut - Lock	1	21AJ-176A	115396	Cover - Oil Sight	1
21AJ-178A	1664	Pin	1	21AJ-176A	4073	Gasket - Oil Gauge	1
21AJ-180A	3189	Screw	1	21AJ-180A	4078	Cover - Oil Gauge	1
21AJ-181A	112438	Cup - Bearing	1	21AJ-181A	3194	Screw	4
21AJ-182A	88795	Cone - Bearing	1				

TURRET AND MICROMETER STOPS



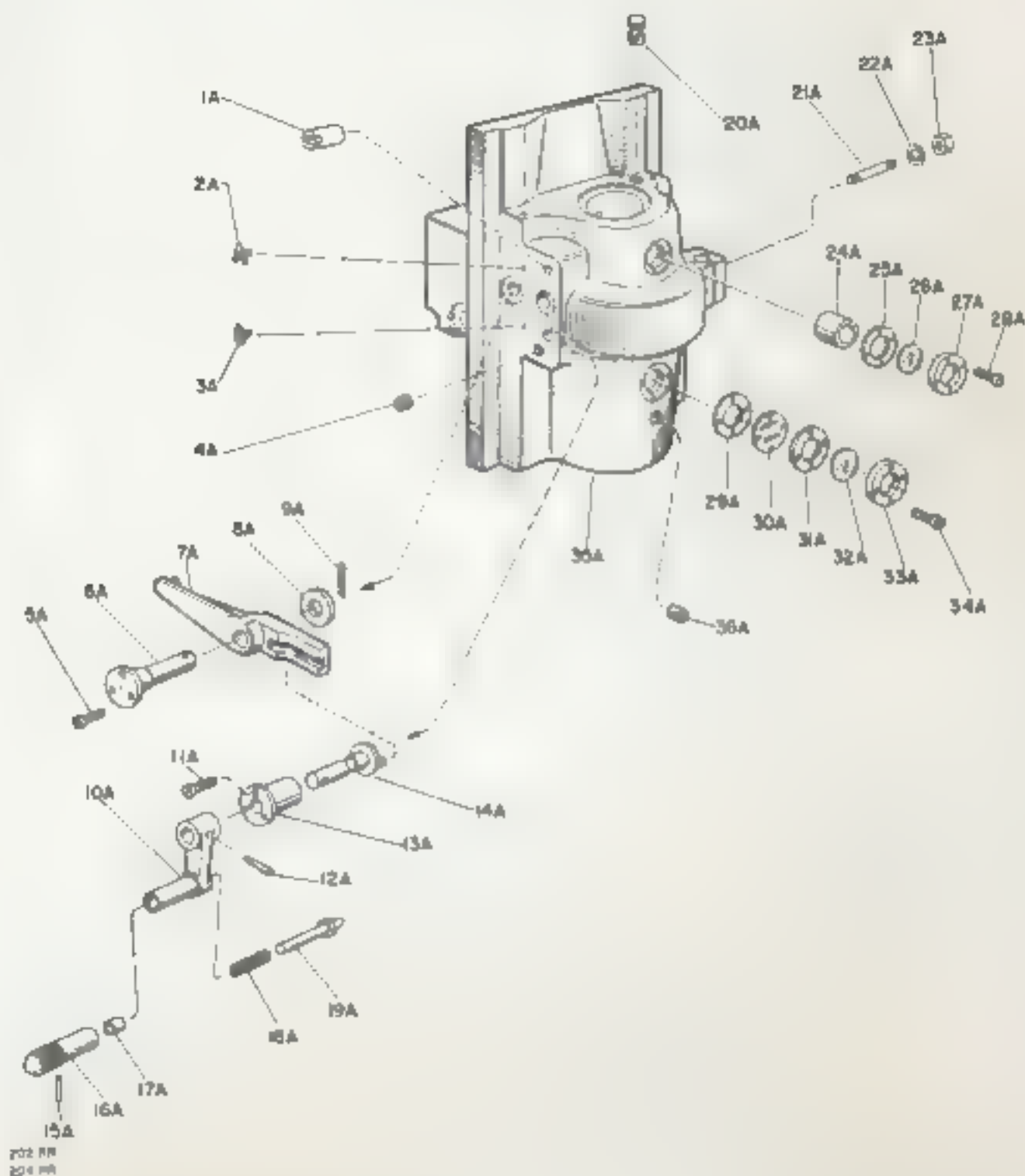
CINCINNATI NOS 2 ML 3 ML AND 4 ML MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 99, "How to Order Repair Parts."

TURRET STOP — UNIT No. 2JAR 2MO VERTICAL MACHINES

Key No.	Part No.	Part Name	Std. Cost	Key No.	Part No.	Part Name	Std. Cost
2JAR-1A	3284	Screw	2	2JAR-26A	10311	Lever - Indicates Operating	1
2JAR-2A	70321	Spring - Compression	2	2JAR-27A	13403	Housing - Indicator	1
2JAR-3A	70313	Braking - Stop	1	2JAR-28A	1303	Screw	1
2JAR-4A	126404	Braking - Turret	1	2JAR-29A	1709	Screw	1
2JAR-5A	116460	Bolt - Tee	1	2JAR-30A		Plunger	1
2JAR-6A	128893	Screw - Stop Adjusting	1		13284	With Hand Feed	1
2JAR-7A	50930	Nut - Adjusting Screw Lock	1		104573	With Hand Feed	1
2JAR-8A	70318	Spring	4	2JAR-31A	70318	Cover - Plunger	1
2JAR-9A	3942	Spring - Compression	1	2JAR-32A	343	Spring	1
2JAR-10A	20154	Bolt - Head	1	2JAR-33A	10311	Pin - Plunger	1
2JAR-11A	3318	Plug	1	2JAR-34A	1304	Screw	1
2JAR-12A	70321	Turret	1	2JAR-35A	10311	Indicator - Dial	1
2JAR-13A	300136	Bolt - Tee	1	2JAR-36A	1303	Screw - Pin	1
2JAR-14A	3441	Washer	1	2JAR-37A	13427	Screw - Adjusting (With Hand Feed Only)	1
2JAR-15A	3676	Nut - Box	1	2JAR-38A	13430	Dial - Head Adjusting (With Hand Feed Only)	1
2JAR-16A	845	Pin - Taper	1		10326	Bolt - Tee (With Hand Feed Only)	1
2JAR-17A	1382	Pin (With Hand Feed Only)	1	2JAR-39A	130417	Bracket - Micrometer (With Hand Feed Only)	1
2JAR-18A	3132	Washer - Lock - With Power Feed Only	1		143	Key (With Hand Feed Only)	1
2JAR-19A	3472	Nut - Box (With Power Feed Only)	1	2JAR-40A	3941	Washer - Plate (With Hand Feed Only)	1
2JAR-20A	118853	Screw - Adjusting With Power Feed Only	1	2JAR-41A	884	Nut - Box (With Hand Feed Only)	1
2JAR-21A	128853	Cover - Indicator Arm Rest	1	2JAR-42A	3441	Washer - Plate (With Hand Feed Only)	1
2JAR-22A	44271	Screw	1	2JAR-43A	1043	Screw (With Hand Feed Only)	1
2JAR-23A	3135	Washer - Lock	1				
2JAR-24A	3184	Screw	1				
2JAR-25A	10310	Key - Lever	1				

SHIFTER CONTROL AND OIL GAGES



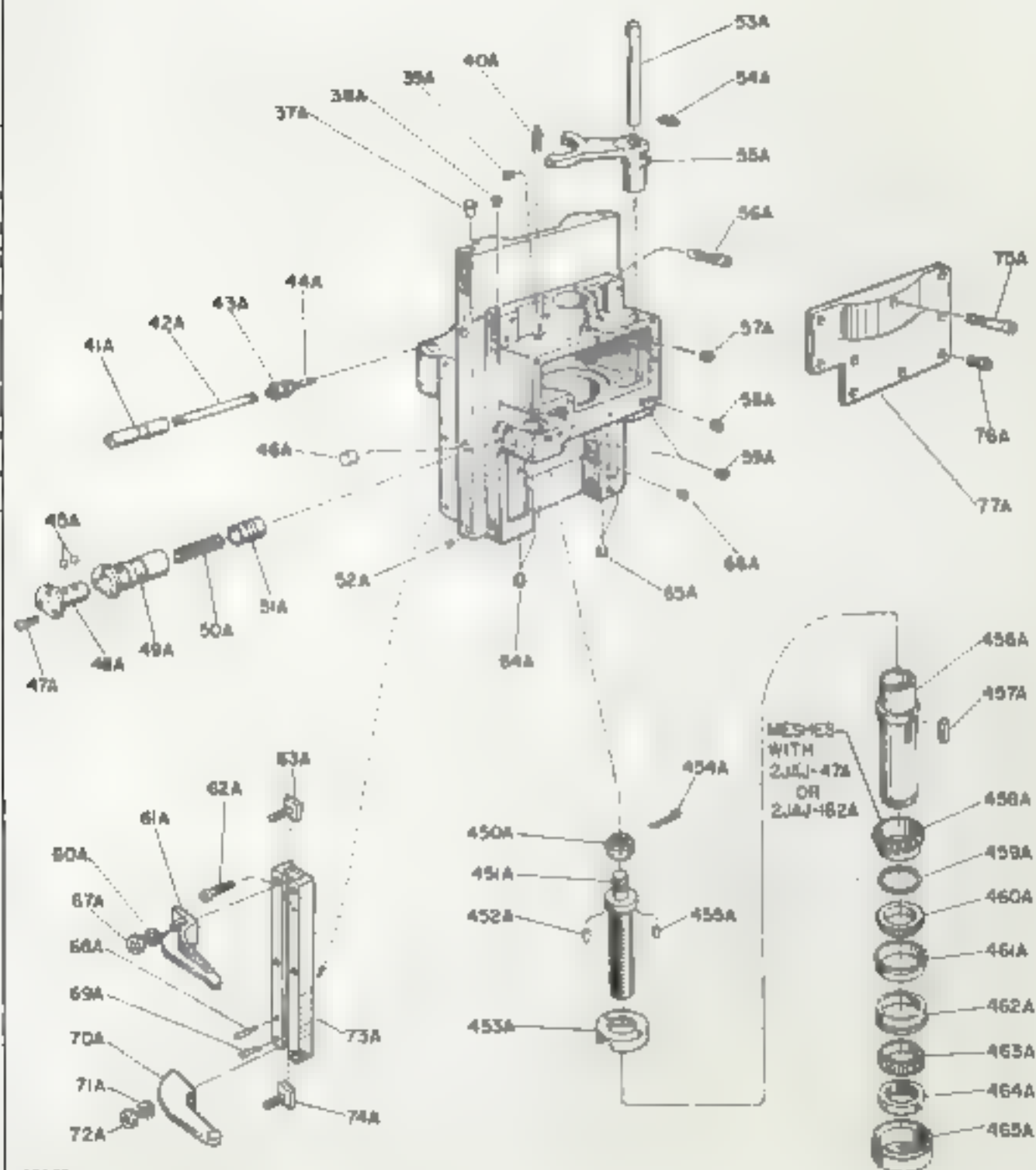
CINCINNATI NOS 2 ML, 3 ML AND 3 MJ MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repeat Parts."

VERTICAL HEAD — UNIT No. 2JDV 2MJ VERTICAL MACHINES

Key No.	Part No.	Part Name	Am. Used	Key No.	Part No.	Part Name	Am. Used
2JDV-1A	95412	Stop - Change Feed Lever	1	2JDV-19A	111352	Pump - Index	1
2JDV-2A	3334	Lever - "A"	1	2JDV-20A	66639	Plug - Oil Filter	1
2JDV-3A	3335	Lever - "B"	1	2JDV-21A	186434	Plug - Coolant Pipe Clamp	1
2JDV-4A	330784	Plug - Pipe	1	2JDV-22A	3441	Washer	1
2JDV-5A	3363	Screw	1	2JDV-23A	3439	Nut - Hex	1
2JDV-6A	130483	Shaft - Shimmer Lever	1	2JDV-24A	130123	Block - Sight Oil Gauge	1
2JDV-7A	115249	Lever - Gear Shifter	1	2JDV-25A	4012	Gasket - Oil Gauge	1
2JDV-8A	1040	Washer	1	2JDV-26A	6074	Dial - Oil Gauge	1
2JDV-9A	3489	Pin - Cotter	1	2JDV-27A	6278	Cover - Oil Gauge	1
2JDV-10A	111251	Lever - Index	1	2JDV-28A	5107	Screw	1
2JDV-11A	3363	Screw	1	2JDV-29A	4012	Gasket - Oil Gauge	1
2JDV-12A	145	Pin - Taper	1	2JDV-30A	61441	Dial - Oil Gauge	1
2JDV-13A	130852	Shafting - Lower Shaft	1	2JDV-31A	4591	Gasket - Oil Gauge	1
2JDV-14A	130840	Shaft - Index Lever	1	2JDV-32A	6074	Dial - Oil Gauge	1
2JDV-15A	3363	Pin - Taper	1	2JDV-33A	4012	Cover - Oil Gauge	1
2JDV-16A	113838	Washer - Speed Change	1	2JDV-34A	1107	Screw	1
2JDV-17A	100892	Shafting - Speed Change Lever	1	2JDV-35A	130483	Shaft - Vertical	1
2JDV-18A	335	Spring	1	2JDV-36A	38841	Plug - Pipe	1

VERTICAL HEAD FEED SCREW AND PUMP



202 RR
204 RR

CINCINNATI NOS 2 MI, 3 MI AND 5 MI MILLING MACHINES

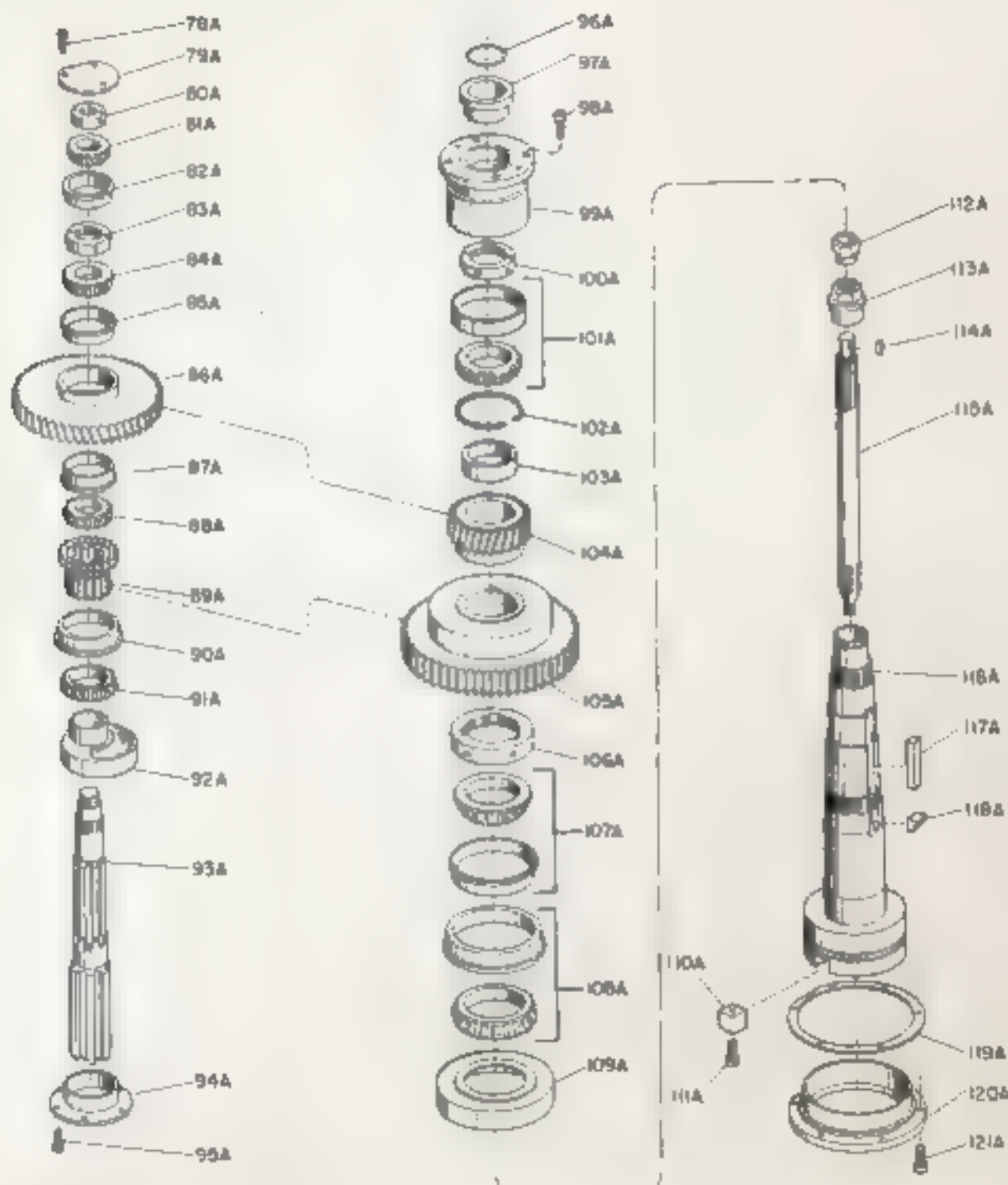
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions see Page 77, "How to Order Repair Parts."

VERTICAL HEAD — UNIT No. 2JDV (Continued)

2MI VERTICAL MACHINES

Key No	Part No	Part Name	Qty Used	Key No	Part No	Part Name	Qty Used
2JDV-27A	11937	Order	1	2JDV-44A	4334	Plug - Pipe	1
2JDV-31A	4236	Plug - Pipe	2	2JAJ-42A	884	Pin - Nut	1
2JDV-36A	7444	Plug - Pipe	1	2JDV-46A	843	Pin - Taper	2
2JDV-40A	11937	Stud - Counter Right	1	2JDV-49A	4344	Screw	2
2JDV-41A	12047	Plug - Oil Pipe	1	2JAJ-50A	12048	Plug - Lower Rod	1
2JDV-42A	12047	Tube - Oil Indicator	1	2JAJ-51A	2441	Washer	1
2JDV-43A	22417	Flange - Tubing	1	2JAJ-52A	844	Pin - Set	1
2JDV-44A	12047	Pipe - Oil Spray	1	2JDV-53A	11344	Guide - Vertical Head Stop	1
2JDV-45A	40154	Ball - Head	4	2JAJ-54A	2514	Roll - Tie	1
2JDV-46A	21337	Pin - Screw Clamp	1	2JDV-55A	3237	Screw	1
2JDV-47A	1204	Screw	4	2JDV-56A	1204	Screw	4
2JDV-48A	18042	Valve - Oil Pump	2	2JDV-57A	12043	Cover - Vertical Head	1
2JDV-49A	12044	Motor - Oil Pump	2	2JAJ-58A	12041	Nut - Fluted	1
2JDV-50A	11523	Spring - Oil Pump	2	2JC-59A	12134	Screw - Vertical Head Feed	1
2JDV-51A	11523	Plunger - Oil Pump	2	2JC-60A	1431	Pin - Straight	1
2JDV-52A	1844	Plug	3	2JC-61A	11345	Plug - Upper Column	1
2JDV-53A	11524	Roll - Gear Shaft	1	2JC-62A	2022	Pin - Corner	1
2JDV-54A	3234	Screw - Set	1	2JC-63A	1431	Pin - Straight	1
2JDV-55A	11434	Shifter - Gear	1	2JC-64A	11345	Nut - Feed Screw	1
2JDV-56A	11938	Tube - Oil Catcher	1	2JC-65A	3307	Key	1
2JDV-57A	7444	Plug - Pipe	2	2JC-66A	11344	Cover - Head	1
2JDV-58A	4236	Plug - Pipe	1	2JC-67A	11344	Washer - Flange	1
2JDV-59A	7444	Plug - Pipe	2	2JC-68A	12045	Cap - Bearing	1
2JAJ-60A	5441	Washer	1	2JC-69A	12045	Cap - Bearing	1
2JAJ-61A	12045	Cap - Upper Rod	1	2JC-70A	12045	Cap - Bearing	1
2JDV-62A	3237	Screw	4	2JC-71A	12045	Cap - Bearing	1
2JAJ-63A	2514	Roll - Tie	2	2JC-72A	4142	Nut - Adjusting	1
2JDV-64A	7444	Plug - Pipe	2	2JC-73A	12041	Plug - Vertical Head	1
2JDV-65A	7444	Plug - Pipe	2				

VERTICAL SPINDLE AND BACK SHAFT



100000

CINCINNATI NOS 2 ML 2 M AND 3 M MILING MACHINES

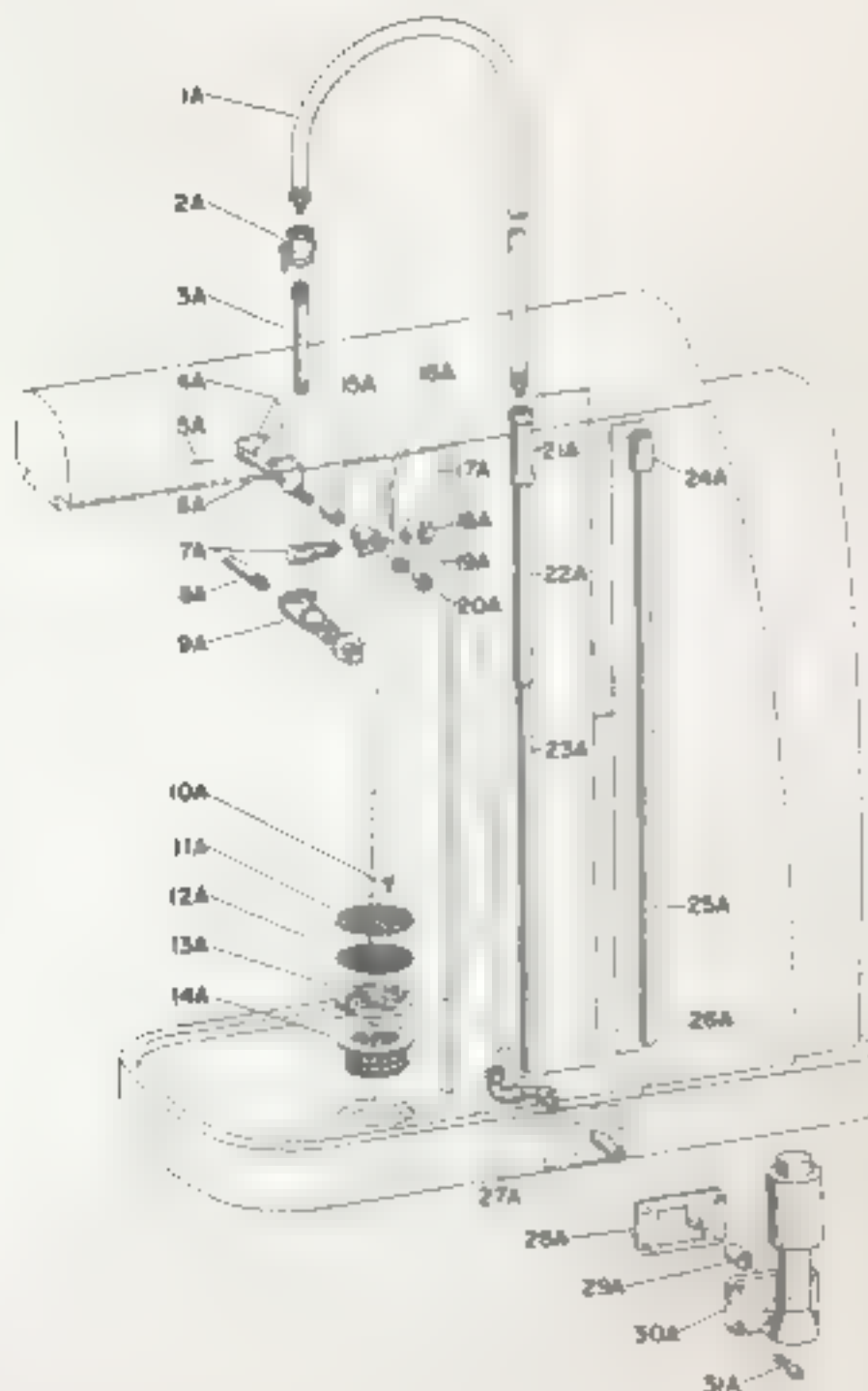
WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

VERTICAL HEAD — UNIT No. 2JDV (Concluded)

2M VERTICAL MACHINES

Key No.	Part No.	Part Name	Am't	Key No.	Part No.	Part Name	Am't
2JDV-74A	1303	Screw	1	2JDV-80A	113413	Nut - Lock	1
2JDV-75A	113390	Cone - Splined Shaft	1	2JDV-81A	113417	Bearing - Roller	1
2JDV-80A	4184	Nut - Lock	1	2JDV-82A	113419	Ring - Locking Spring	1
2JDV-81A	113401	Cone - Bearing	1	2JDV-83A	113423	Spacer - Spindle	1
2JDV-82A	113418	Cup - Bearing	1	2JDV-84A	113431	Gear - High Speed Helical Spindle	1
2JDV-83A	113427	Nut - Lock	1	2JDV-85A	113445	Gear - Low Speed Helical Spindle	1
2JDV-84A	113433	Cone - Bearing	1	2JDV-86A	1453	Pin - Lock	1
2JDV-85A	113444	Cup - Bearing	1	2JDV-87A	113436	Bearing - Roller	1
2JDV-86A	113452	Gear - Clutch	1	2JDV-88A	113440	Bearing - Roller	1
2JDV-87A	113454	Cup - Bearing	1	2JDV-89A	113457	Engage - Oil - Spindle	1
2JDV-88A	113463	Cone - Bearing	1	2JDV-90A	1461	Key - Arbor Drive	3
2JDV-89A	113465	Gear - Clutch Sliding	1	2JDV-91A	1159	Screw	3
2JDV-90A	113467	Cup - Bearing	1	2JDV-92A	1475	Head - Draw Bar	1
2JDV-91A	113474	Cone - Bearing	1	2JDV-93A	1461	Nut - Draw Bar	1
2JDV-92A	113482	Eccentric - Pump	1	2JDV-94A	1294	Key - Woodruff	1
2JDV-93A	113491	Shift - Spindle	1	2JDV-95A	113469	Ball - Draw	1
2JDV-94A	113498	Retainer - Oil	1	2JDV-96A	113494	Spindle - Vertical	1
2JDV-95A	1304	Screw	4	2JDV-97A	1494	Key - Square	1
2JDV-96A	1461	Ring - Locking Spring	1	2JDV-98A	1454	Key - Splitting Lock	1
2JDV-97A	113494	Cup - Spindle	1	2JDV-99A	113495	Gasket - Retainer	1
2JDV-98A	1394	Screw	4	2JDV-100A	113496	Retainer - Oil	1
2JDV-99A	113498	Retainer - Splitting	1	2JDV-101A	1294	Screw	4

COOLANT SUPPLY PLAIN AND UNIVERSAL MACHINES

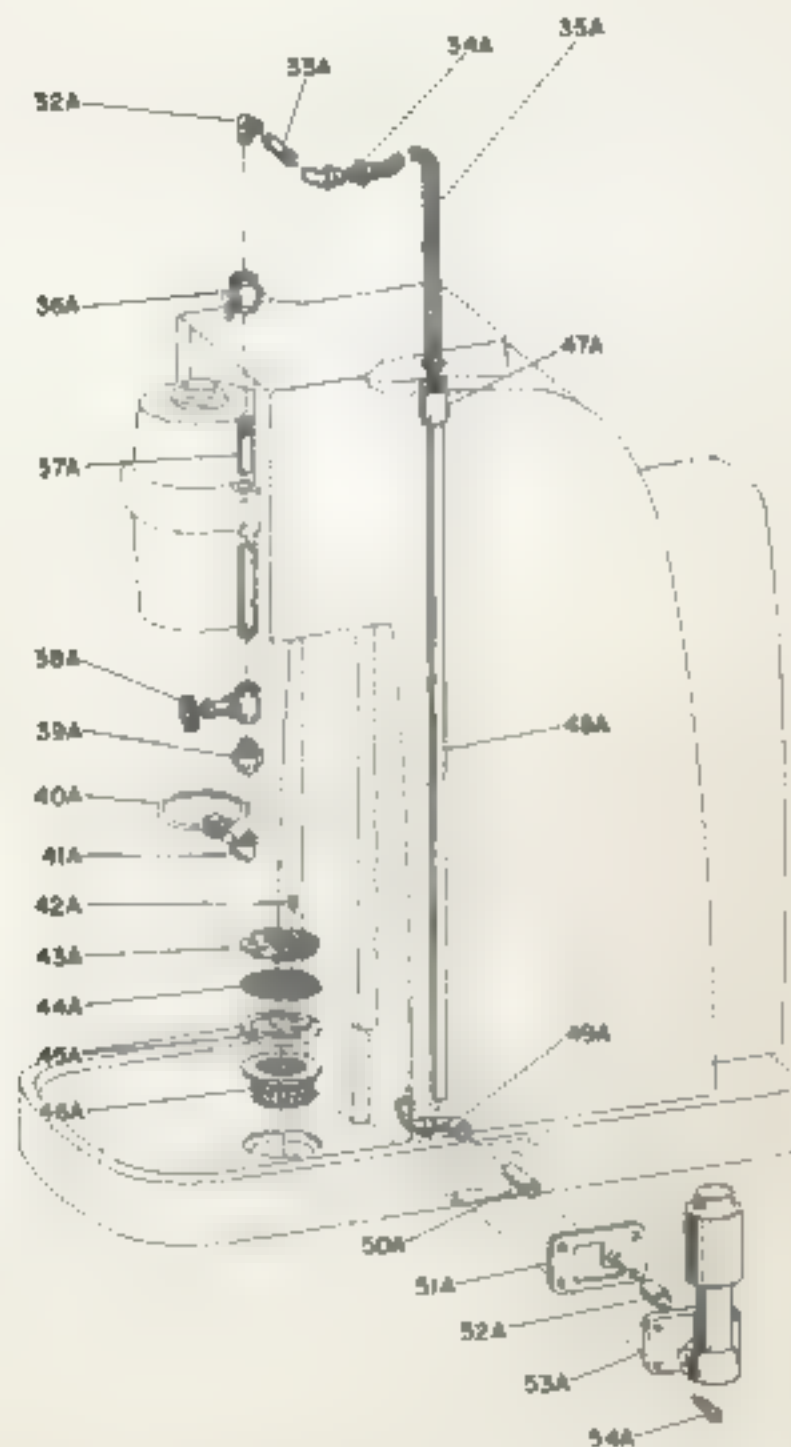


CINCINNATI NOS. 2 ML 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 38, "How to Order Repair Parts."

COOLANT — UNIT No. 2JP PLAIN AND UNIVERSAL MACHINES

Key No.	Part No.	Part Name	Unit Cost	Key No.	Part No.	Part Name	Unit Cost
2JP-1A	100628	Nozzle - Coolant	1	2JP-25A	14400	Set - Box	1
2JP-2A	100778	Valve - Stop	1	2JP-25A	144239	Coupling (2MI, 3MI Machines Only)	1
2JP-3A	100166	Pipe - Supply Valve	1	2JP-25A	144237	Tube - Siphon (2MI, 3MI Machines Only)	1
2JP-4A	100043	Clamp - On Overhead	2	2JP-25A	144236	Pipe - Coolant	1
2JP-5A	642	Pin - Taper	1	2JP-25A	144234	2MI Machines	1
2JP-6A	113816	Stud - Overhead Pump	1	2JP-25A	144231	3MI Machines	1
2JP-7A	110321	Holder - Supply Pipe	1	2JP-25A	144192	Coupling - Supply Pipe (2MI Machines Only)	1
2JP-8A	111309	Nut - Coolant Supply	1	2JP-25A	144189	Pin - Coolant (2MI Machines Only)	1
2JP-9A	108194	Valve - Angle	1	2JP-25A	144187	Pipe - Coolant Supply	1
2JP-10A	2154	Screw	4	2JP-25A	144186	2MI, 3MI Machines	1
2JP-11A	25875	Screen - Fine Mesh	1	2JP-25A	144183	2MI Machines	1
2JP-12A	25873	Screen - Fine Mesh	1	2JP-25A	144181	Assembly - Coolant Elbow	1
2JP-13A	25871	Frame - Washer	1	2JP-25A	144174	Gasket - Pump	1
2JP-14A	114828	Strainer - In Column	1	2JP-25A	144181	Sealing - Coolant Supply	1
2JP-15A	108188	Spacer - Clamp Stud	1	2JP-25A	144180	Pump - Coolant	1
2JP-16A	100030	Clamp - Supply Pipe Holder	1	2JP-25A	144179	Full-Size - Motor	1
2JP-17A	1040	Washer	1	2JP-25A	144178	Flange	1
2JP-18A	2480	Nut - Box	1	2JP-25A	144177	Screw	1
2JP-19A	1040	Washer	1				

COOLANT SUPPLY
2MI VERTICAL MACHINES

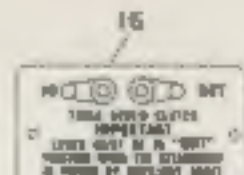
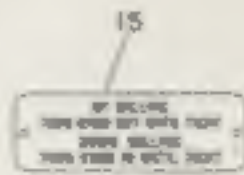
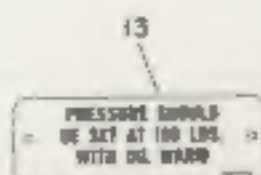
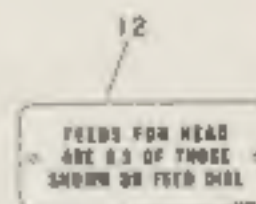
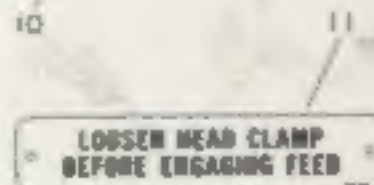
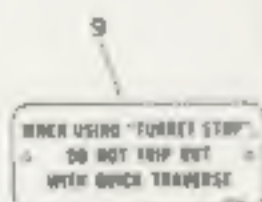
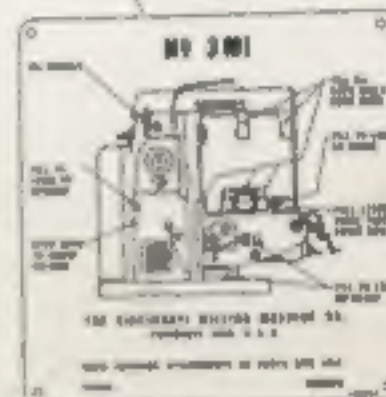
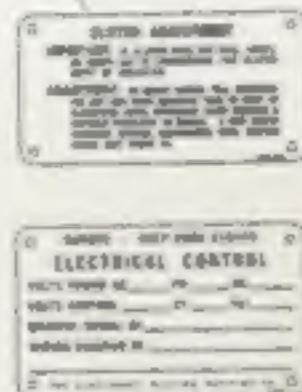
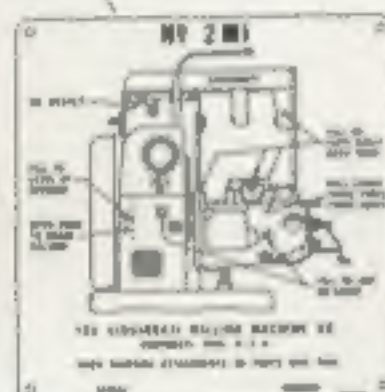
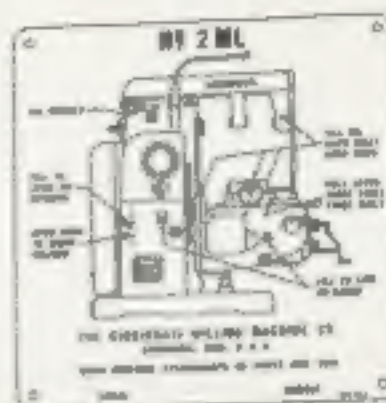
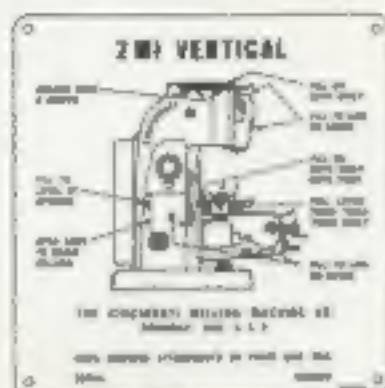
CINCINNATI NOS 2 ML 3 ML AND 3 ML MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 39, "How to Order Repair Parts."

COOLANT—UNIT No. 2JP (Concluded) 2ML VERTICAL MACHINES

Key No.	Part No.	Part Name	Qty. Used	Key No.	Part No.	Part Name	Qty. Used
2JP-33A	38432	Elbow - Brass	1	2JP-41A	91473	Bracket - Free Wheel	1
2JP-33A	38437	Knipple - Pipe	1	2JP-41A	91471	Frame - Strainer	1
2JP-34A	52575	Y fitting	1	2JP-41A	124539	Strainer - In Column	1
2JP-35A	228294	Iron - Flange	1	2JP-41A	124532	Coupling - Supply Pipe	1
2JP-36A	104779	Valve - Stop	1	2JP-44A	147236	Pipe - Coolant	1
2JP-37A	179122	Pipe - Coolant Supply	1	2JP-47A	147235	Assembly - Coolant Elbow	1
2JP-38A	135480	Valve - Check	1	2JP-50A	146380	Pipe - Coolant Supply	1
2JP-39A	90848	Union - Pipe	1	2JP-51A	144104	Gasket - Pump	2
2JP-40A		Spray - Coolant		2JP-52A	144105	Sealing - Coolant Supply	2
	130112	Small	1	2JP-52A		Pump - Coolant	
	130944	Large	1		117999	Fasteners - Motor	1
2JP-41A	38812	Elbow - Wye	1		124428	Pump	1
2JP-43A	3124	Strut	4	2JP-51A	9341	Screw	4
2JP-43A	85873	Screen - Coarse Mesh	1				

INSTRUCTION PLATES



CINCINNATI NOS. 2 ML, 2 MI AND 3 MI MILLING MACHINES

WHEN ORDERING PARTS, give key number, part name and part number. Be sure to give complete serial number for your machine. For complete instructions, see Page 19, "How to Order Repair Parts."

INSTRUCTION PLATES 2ML, 2MI AND 3MI PLAIN AND UNIVERSAL 2MI VERTICAL

Key No.	Part No.	Part Name	Am't. Used	Key No.	Part No.	Part Name	Am't. Used
1A	4315	Plate - Direction	1	18A	4316	Plate - Electrical Control	1
3A	194766	Plate - Spindle Stop	1	11A	194769	Plate - Head Clamp Instruction (Vertical Machines)	1
2A	194768	Plate - Cutting (2MI Plain and Universal)	1	11A	194769	Plate - Head Clamp Instruction (Vertical Machines)	1
4A	194764	Plate - Cutting (2MI Vertical)	1	11A	194772	Plate - Knee Pump Pressure Adjustment	1
8A	194762	Plate - Clutch Adjustment	1	14A	194773	Plate - Control	1
9A	194771	Plate - Column Ramp Pressure Adjustment	1	19A	194781	Plate - Backlash Eliminator Control	1
1A	194844	Plate - Cutting (3MI Machines)	1	16A	194780	Plate - Table Screw Clutch (With Short Lead Attachment)	1
1A	194765	Plate - Cutting (2MI Machines)	1				
9A	194763	Plate - Turbine Stop Instruction (Vertical Machines)	1				





MILLING MACHINES



SPINNING MACHINES



BROACHING MACHINES



ENTER SHAPING MACHINES



OPTICAL PROJECTION GRINDERS



FLAME HARDENING MACHINES



METAL FORMING MACHINES



CUTTING FLUIDS



PRECISION GRINDING WHEELS



Products of The Cincinnati Milling Machine Co. are listed and symbolized here. Products of their associate company, Cincinnati Grinders Incorporated, include a complete line of Camotype, Camerless, and Roll Grinding Machines.

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The products of The Cincinnati Milling Machine Co. and of Cincinnati Grinders Incorporated are sold by Cincinnati Milling and Grinding Machines, Inc.

THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U.S.A.